Illinois Department of Transportation

To:	Anthony J. Quigley	Attn:	John Baczek
From:	Maureen M. Addis MA MMA		
Subject:	Pavement Design Approval		
Date:	June 20, 2017		

Route:	IL 43	Job No.:	D-91-122-12
Section:	3128-Z-I-R&RS	Contract No.:	60R49
County:	Cook	Target Letting:	June 2020
Limits:	Interchange at US 12/20(95th St.)		

We have reviewed the pavement design for the above referenced project which was submitted on April 26, 2017. The scope of the project is:

- Reconstruction/reconfiguration of the existing interchange.
- Removal of two existing loop ramps to eliminate a substandard weave.
- New alignment/realignment and/or reconstruction of the ramps to maintain full access at the interchange.
- Widening and resurfacing of US 12/20 and the outer limits of IL 43.
- Construction of a new access road for a relocated pump station.
- Reconstruction of Ramp J (Illinois Tollway jurisdiction).

For the reconstruction portions of the ramps, IL 43 and the pump station roadway, we concur with the Districts selection of HMA based upon a life cycle cost analysis. For the widening portions of US 12/20 and IL 43, we concur with the District's selection of HMA using first costs. For the short widening segment of US 12/20 adjacent to Ramp J, we concur with the District's decision to match the existing PCC.

If you have any questions, please contact Mike Brand at (217) 782-7651.

Illinois Department of Transportation

Memorandum

To: Maureen Addis

Attn: Michael Brand

From: Jose A. Dominguez

By: Ojas Patel

Subject: Pavement Analysis*

Date: April 26, 2017

*Route: IL 43
Limits: over US 12/20 (95th Street)
Section: 3128-Z-I-R&RS
Current target: 06CY20

County: Cook
Contract No.: 60R49
Job No.: D-91-122-12

We have completed the pavement analysis for the above captioned location. Review by the Central Office is required since the total pavement area for reconstruction exceeds 4,750 Square Yards. The following is the scope of the project:

Reconstruction/reconfiguration of the existing US 12/20 (95th Street) at IL 43 interchange. Removal of two existing loop ramps to eliminate a substandard weave. New alignment/realignment and/or reconstruction of the ramps to maintain full access at the interchange. Widening and resurfacing of US 12/20 and the outer limits of IL 43. Construction of a new access road for a relocated pump station. Reconstruction Ramp J (ISHTA jurisdiction).

A 20-year pavement analysis was performed on the above segments. Our recommendation for US 12/20 and IL 43 widening is as follows based on the mechanistic pavement design procedure using a first cost analysis. For the reconstruction portions, the life cycle cost analysis favored HMA pavement by 21% for the ramps, PCC pavement by 8% for IL 43, and HMA pavement by 18% for the pump station roadway. Since the life-cycle cost analysis does not favor either PCC or HMA pavement by more than 10% for IL 43, our recommendation is to provide HMA pavement for the entire project as it will provide a uniform design for ease of construction and maintenance. A segmental analysis was performed for the widening on US 12/20 adjacent to Ramp J and it is recommended to match the existing PCC pavement in-kind.

US 12/20
Widening and Resurfacing[13]
PCC Curb and Gutter/Portions HMA Shoulder[14]
13 ½" Full Depth HMA
- 1 ¾" Polymerized HMA Surface Course, SMA, N80 (IL-9.5)[1]
- ¾" Polymerized Leveling Binder (Machine Method), IL-4.75, N50[2]
- 11" HMA Binder Course, IL-19.0, N90[3]

12" Aggregate Subgrade Improvement[12]

US 12/20 adjacent to Ramp J (Sta. 601+00 to 603+00)
Widening
PCC Curb and Gutter
10 ½" PCC Pavement[4]
12" Aggregate Subgrade Improvement[12]

US 12/20 Pavement Resurfacing[13]
Cold Milling of HMA Pavement
2 ½" minimum (more if necessary)[15]
- 1 ¾" Polymerized HMA Surface Course, SMA, N80 (IL-9.5)[1]
- ¾" Polymerized Leveling Binder (Machine Method), IL-4.75, N50[2]

IL 43
Reconstruction[13]
PCC Curb and Gutter
13 ½" Full Depth HMA
- 2" Polymerized HMA Surface Course, SMA, N80 (IL-9.5)[1]
- 2 ¼" Polymerized HMA Binder Course, IL-19.0, N90[5]
- 9 ¼" HMA Binder Course, IL-19.0, N90[6]

12" Aggregate Subgrade Improvement[12]

IL 43
Widening and Resurfacing[13]
PCC Curb and Gutter
13 ½" Full Depth HMA
- 1 ¾" Polymerized HMA Surface Course, SMA, N80 (IL-9.5)[1]
- ¾" Polymerized Leveling Binder (Machine Method), IL-4.75, N50[2]
- 11" HMA Binder Course, IL-19.0, N90[3]

12" Aggregate Subgrade Improvement[12]

IL 43 Pavement Resurfacing
Cold Milling of HMA Pavement
2 ½" minimum (more if necessary)
- 1 ¾" Polymerized HMA Surface Course, SMA, N80 (IL-9.5)[1]
- ¾" Polymerized Leveling Binder (Machine Method), IL-4.75, N50[2]

Interchange Ramps
Reconstruction/New construction[13]
HMA Shoulder[14]
10" Full Depth HMA
- 2" Polymerized HMA Surface Course, Mix "E", N70[7]
- 2 ¼" Polymerized HMA Binder Course, IL-19.0, N90[5]
- 5 ¾" HMA Base Course, IL-19.0, N90[8]

12" Aggregate Subgrade Improvement[12]

Interchange Ramp G
Widening and Resurfacing[13]
HMA Shoulder[14]
10" Full Depth HMA
- 1 ¾" Polymerized HMA Surface Course, Mix "E", N70[7]
- ¾" Polymerized Leveling Binder (Machine Method), IL-4.75, N50[2]
- 7 ½" HMA Binder Course, IL-19.0, N90[9]

12" Aggregate Subgrade Improvement[12]

Interchange Ramp (Ramp G Only) Pavement Resurfacing[13]
Cold Milling of HMA Pavement
2 ½" minimum (more if necessary)
- 1 ¾" Polymerized HMA Surface Course, Mix "E", N70[7]
- ¾" Polymerized Leveling Binder (Machine Method), IL-4.75, N50[2]

Pump Station Road
Reconstruction[13]
HMA Shoulder[14]
7 ¼" Full Depth HMA
- 2" HMA Surface Course, Mix "D", N70[10]
- 5 ¼" HMA Base Course, IL-19.0, N70[11]

12" Aggregate Subgrade Improvement[12]

IL 43 and Ramps (Temporary Pavement)
Option 1[16]
- Temporary Pavement
  - 10" Full Depth Temporary HMA Pavement[17]
    - 2" HMA Surface Course, Mix "D", N50
    - 8" HMA Binder Course, IL-19.0, N50
  - 4" Subbase Granular Material Type B (CA-6)[18]

Option 2[16]
- Temporary Pavement
  - 8" Temporary PCC Pavement[17]
  - 4" Subbase Granular Material Type B (CA-6)[18]

[1]Designer Note 1: Use pay item **X4060004, POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, SMA, N80 (IL-9.5)** paid for in tons.

[2] Designer Note 2: Use pay item **40600827, POLYMERIZED LEVELING BINDER (MACHINE METHOD), IL-4.75, N50** paid for in tons.

[3] Designer Note 3: For widening of six feet or less use pay item **35600720 HOT-MIX ASPHALT BASE COURSE WIDENING, 11"** paid for in square yards. For widening of greater than six feet use pay item **35501328 HOT-MIX ASPHALT BASE COURSE, 11"** paid for in square yards.

[4]Designer Note 4: Use pay item **42000511, PORTLAND CEMENT CONCRETE PAVEMENT 10 ½" (JOINTED),** paid for in square yards.

[5] Designer Note 5: Use pay item **40603240, POLYMERIZED HMA BINDER COURSE, IL-19.0, N90** paid for in tons.

[6]Designer Note 6: Use pay item **35501321, HOT-MIX ASPHALT BASE COURSE, 9 ¼",** paid for in square yards.

[7] Designer Note 7: Use pay item **40603565, POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "E", N70** paid for in tons.

[8]Designer Note 8: Use pay item **35501307, HOT-MIX ASPHALT BASE COURSE, 5 ¾",** paid for in square yards.

[9] Designer Note 9: For widening of six feet or less use pay item **35600720 HOT-MIX ASPHALT BASE COURSE WIDENING, 7 ½"** paid for in square yards. For widening of greater than six feet use pay item **35501328 HOT-MIX ASPHALT BASE COURSE, 7 ½"** paid for in square yards.

[10]Designer Note 10: Use pay item **40603340, HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70** paid for in tons.

[11]Designer Note 11: Use pay item **35501305, HOT-MIX ASPHALT BASE COURSE, 5 ¼",** paid for in square yards.

[12]Designer Note 12: Use pay item **30300112, AGGREGATE SUBGRADE IMPROVEMENT, 12"**, paid in square yards.

[13]Designer Note 13: Refer to the District One, Bureau of Materials' "Hot-Mix Asphalt – Mix Selection" tables to determine the corresponding HMA mix table requirements for the plans.

[14] Designer Note 14: The designer shall utilize IDOT Highway Standards in conjunction with guidelines in BDE Manual 34-2.02 if necessary for shoulder thicknesses.

[15] Designer Note 15: Due to the existing vertical clearance under the existing railroad structure over US 12/20, some pavement cores reflect only 1" HMA surface over PCC base course. Ensure that minimum vertical clearances are provided.

[16] Designer Note 16: The contractor shall have the option of constructing either material type if both Portland cement concrete and HMA are shown in the plans. For quantity estimation purposes, excavation quantities should be estimated assuming the thicker design if both options are shown in the plans.

[17] Designer Note 17: Use pay item **Z0062456, TEMPORARY PAVEMENT**, paid in square yards.

The HMA temporary pavement shall consist of two items, HMA binder course and HMA surface course. Include both items in the HMA mix table requirements.

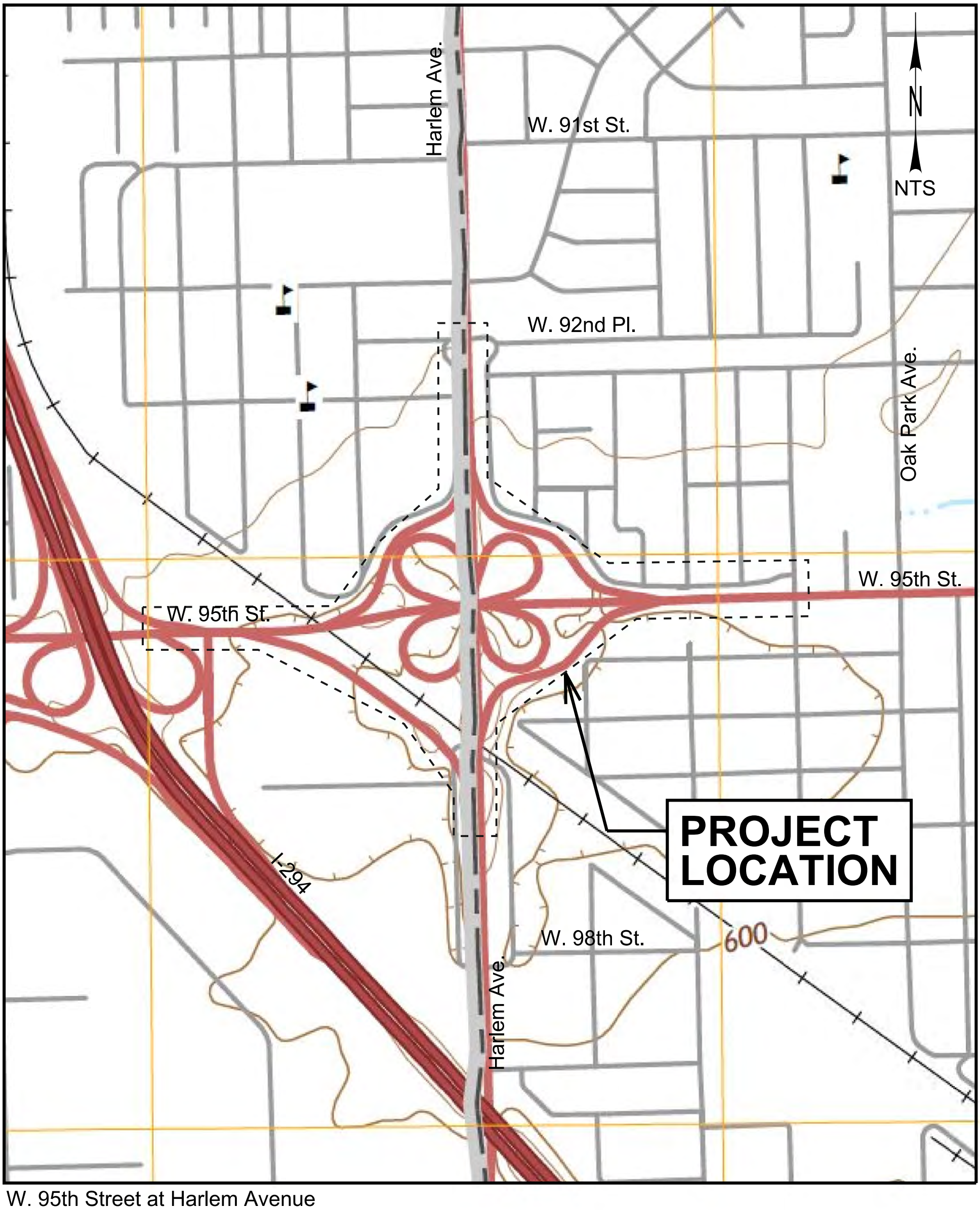
When PC Temp Pavement is used as an option, the following note shall appear on the plans adjacent to the HMA mix table: "PC Concrete temporary pavement shall consist of Class PV Concrete meeting the requirements of Art.1020 of the Standard Specifications. Temporary PCC pavement does not require dowel bars.

[18] Designer Note 18: Use pay item **31101200, SUBBASE GRANULAR MATERIAL, TYPE B 4"**, paid in square yards

If you have any questions or need additional information, please contact Ojas Patel, Pavement Design Engineer, at (847)705-4550.

By: Jose A. Dominguez
Jose A. Dominguez, P.E.
Project Support Engineer

Location Map - Contract 60R49



W. 95th Street at Harlem Avenue
W. 95th Street - I-294 to S. 69th Avenue
Harlem Avenue - W. 92nd Place to W. 98th Street
Pavement Analysis
Palos Park Quadrangle

BDE 5401 Template (Rev. 09/05/2013)

IDOT MECHANISTIC PAVEMENT DESIGN

Printed: 10/24/2017

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: IL 43
Section: 3128-Z-I-R&S
County: Cook
Location:
Comments: IL 43 over US 12/20 (95th St)
Design Date: 02/15/2017 ONP <-- BY
Modify Date: <-- BY

	ADT	Year
Current:	50,000	2014
Future:	52,500	2040

Facility Type: Other Marked State Route
# of Lanes = 4
Road Class: I
Subgrade Support Rating (SSR): Poor
Construction Year: 2019
Design Period (DP) = 20 years

	Structural Design Traffic			
	Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane
PV =	0	44,806	87.1%	P = 32%
SU =	250	3,550	6.9%	S = 45%
MU =	750	3,087	6.0%	M = 45%
Struct. Design ADT =		51,442	(2029)	

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT			RIGID PAVEMENT		
Cpv =	0.15		Cpv =	0.15	
Csu =	132.5		Csu =	143.81	
Cmu =	482.53		Cmu =	696.42	
TF flexible (Actual) =	17.68	(Actual ADT)	TF rigid (Actual) =	23.98	(Actual ADT)
TF flexible (Min) =	3.56	(Min ADT Fig. 54-2.C)	TF rigid (Min) =	5.02	(Min ADT Fig. 54-2.C)

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement

Use TF flexible = 17.68
PG Grade Lower Binder Lifts = PG 64-22 (Fig. 53-4.R)
Goto Map
HMA Mixture Temp. = 75.0 deg. F (Fig. 54-5.C)
Design HMA Mixture Modulus (E_{HMA}) = 690 ksi (Fig. 54-5.D)
Design HMA Strain (ε_{HMA}) = 53 (Fig. 54-5.E)
Goto Map
Full Depth HMA Design Thickness = 13.50 in. (Fig. 54-5.F)
Limiting Strain Criterion Thickness = 14.75 in. (Fig. 54-5.I)

Use Full-Depth HMA Thickness = 13.50 inches

JPC Pavement

Use TF rigid = 23.98
Edge Support = Tied Shoulder or C.&G.

Rigid Pavt Thick. = 10.50 in. (Fig. 54-4.E)

CRC Pavement

Use TF rigid = 23.98
IBR value = 3

CRCP Thickness = 10.25 in. (Fig. 54-4.M)

TF MUST BE > 60 FOR CRCP

RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS

HMA Overlay of Rubblized PCC

Use TF flexible = 17.68
HMA Overlay Design Thickness = 11.00 in. (Fig. 54-5.U)
Goto Map
Limiting Strain Criterion Thickness = in. (Fig. 54-5.V)

Use HMA Overlay Thickness = 999.00 inches

Unbonded Concrete Overlay

Review 54-4.03 for limitations and special considerations.

JPCP Thickness = NA inches

CONTACT BMPR FOR ASSISTANCE

DESIGN TABLES FROM BDE MANUAL CHAPTER 54 - PAVEMENT DESIGN

Class I Roads	Class II Roads	Class III Roads	Class IV Roads
4 lanes or more Part of a future 4 lanes or more One-way Streets with ADT > 3500	2 lanes with ADT > 2000 One way Street with ADT <= 3500	2 Lanes (ADT 750 -2000)	2 Lanes (ADT < 750)

	Min. Str. Design Traffic (Fig 54-2.C)		
Facility Type	PV	SU	MU
Interstate or Freeway	0	500	1500
Other Marked State Route	0	250	750
Unmarked State Route	No Min	No Min	No Min

Class Table for One-Way Streets	
ADT	Class
0 - 3500	II
>3501	I

	Traffic Factor ESAL Coefficients			
	Rigid (Fig. 54-4.C)		Flexible (Fig. 54-5.B)	
Class	Csu	Cmu	Csu	Cmu
I	143.81	696.42	132.50	482.53
II	135.78	567.21	112.06	385.44
III	129.58	562.47	109.14	384.35
IV	129.58	562.47	109.14	384.35

Class Table for 2 or 3 lanes (not future 4 lane & not one-way street)	
ADT	Class
0 - 749	IV
750 - 2000	III
>2000	II

	Design Lane Distribution Factors For Structural Design Traffic (Fig. 54-2.B)					
	Rural			Urban		
Number of Lanes	P	S	M	P	S	M
1 Lane Ramp	100%	100%	100%	100%	100%	100%
2 or 3	50%	50%	50%	50%	50%	50%
4	32%	45%	45%	32%	45%	45%
6 or more	20%	40%	40%	8%	37%	37%

BDE 5401 Template (Rev. 09/05/2013) Printed: 10/24/2017

LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

FULL-DEPTH HMA PAVEMENT

Standard Design

ROUTE	**IL 43**
SECTION	**3128-Z-I-R&S**
COUNTY	**Cook**
LOCATION	
FACILITY TYPE	**NON-INTERSTATE**

PROJECT LENGTH			**570**	FT = = >	0.11	Miles
# OF CENTERLINES			**2**	CL		
# OF LANES			**4**	LANES		
# OF EDGES			**4**	EP		
LANE WIDTH - AVERAGE			**12**	FT		
SHOULDER WIDTH	HMA	Inside	**0**	FT		
	HMA	Outside	**0**	FT		
	Total Width of Paved Shoulders		**0**	FT		

PAVEMENT THICKNESS (FLEXIBLE)	**13.50**	IN	**14.75**	IN MAX
SHOULDER THICKNESS	**8.00**	IN	HMA_SD	**Standard Design**
POLICY OVERLAY THICKNESS	**2.25**	IN		

FLEX PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	3.56	**17.68**	**17.68**

Read Me!

HMA COST PER TON	UNIT PRICE	
HMA SURFACE	**$114.17**	/ TON
HMA TOP BINDER	**$107.13**	/ TON
HMA LOWER BINDER	**$74.74**	/ TON
HMA BINDER (LEVELING)	**$109.65**	/ TON
HMA SHOULDER	**$72.00**	/ TON

INITIAL COSTS

ITEM	THICKNESS		100% QUANTITY	UNIT		UNIT PRICE		COST	
HMA PAVEMENT (FULL-DEPTH)	(13.50")	3040	3,040	SQ YD	*	**$65.70**	/ SQ YD	$199,728	~
HMA SURFACE COURSE	(2.00")	1.0069	343	TONS		**$114.17**	/ TON	$0	
HMA TOP BINDER COURSE	(2.25")	1.0217	391	TONS		**$107.13**	/ TON	$0	
HMA LOWER BINDER COURSE	(9.25")	1.0616	1,672	TONS		**$74.74**	/ TON	$0	
HMA SHOULDER	(8.00")	0	0	TONS		**$72.00**	/ TON	$0	~
CURB & GUTTER			2,280	LIN FT	*	**$30.00**	/ LIN FT	$68,400	
SUBBASE GRAN MATL TY C (TONS)			37	TONS		**$25.00**	/ TON	$925	
IMPROVED SUBGRADE:	Aggregate	Width = 54.5'	3,452	SQ YD		**$7.00**	/ SQ YD	$24,164	
Reserved For User Supplied Item			0	**UNITS**		**$0.00**	/ UNITS	$0	
Reserved For User Supplied Item			0	**UNITS**		**$0.00**	/ UNITS	$0	
PAVEMENT REMOVAL			3,040	SQ YD		**$15.00**	/ SQ YD	$45,600	
SHOULDER REMOVAL			0	SQ YD		**$0.00**	/ SQ YD	$0	

Note: * Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST	$338,817
FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE	$128,005

MAINTENANCE COSTS:

ITEM		THICKNESS		MATERIAL	T	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY						**$0.00**	LANE-MILE / YEAR
HMA OVERLAY PVMT SURF		(2.00")	1.0069	Surface Mix	2.00	**$12.88**	/ SQ YD
HMA OVERLAY PVMT		(2.25")	1.0078		2.25	**$14.31**	/ SQ YD
HMA SURFACE MIX		(1.50")	1.0052	Surface Mix	1.50	**$9.64**	/ SQ YD
HMA BINDER MIX		(0.75")	1.0130	eling Binder Mix	0.75	**$4.67**	/ SQ YD
HMA OVERLAY SHLD	(Year 30)	(2.25")		Shoulder Mix	2.25	**$9.07**	/ SQ YD
HMA OVERLAY SHLD		(2.00")		Shoulder Mix	2.00	**$8.06**	/ SQ YD
MILLING (2.00 IN)					2.00	**$3.00**	/ SQ YD
PARTIAL DEPTH PVMT PATCH		(Mill & Fill Surf)		Surface Mix	2.00	**$82.79**	/ SQ YD

PARTIAL DEPTH SHLD PATCH	(Mill & Fill Surf)	Shoulder Mix	2.00	**$78.06**	/ SQ YD
PARTIAL DEPTH PVMT PATCH	(Mill & Fill +2.00 ")	Leveling Binder Mix	2.00	**$82.28**	/ SQ YD
PARTIAL DEPTH SHLD PATCH	(Mill & Fill +2.00 ")	Shoulder Mix	2.00	**$78.06**	/ SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL				**$2.00**	/ LIN FT
CENTERLINE JOINT ROUT & SEAL				**$2.00**	/ LIN FT
RANDOM / THERMAL CRACK ROUT & SEAL	(100% Rehab = 110.00' / Station / Lane)			**$2.00**	/ LIN FT

FLEXIBLE TOTAL LIFE-CYCLE COST	$428,306
FLEXIBLE TOTAL ANNUAL COST PER MILE	$161,814

PCC PAVEMENT — JPCP

ROUTE			IL 43		
SECTION			3128-Z-I-R&S		
COUNTY			Cook		
LOCATION			0		
FACILITY TYPE			NON-INTERSTATE		
PROJECT LENGTH			570 FT = = >	0.11 Miles	
# OF CENTERLINES			2 CL		
# OF LANES			4 LANES		
# OF EDGES			4 EP		
LANE WIDTH - AVERAGE			12 FT		
SHOULDER WIDTH	PCC	Inside	0 FT		
	PCC	Outside	0 FT		
	Total Width of Paved Shoulders		0 FT		
PAVEMENT THICKNESS (RIGID)		JPCP	10.50 IN	TIED SHLD	
SHOULDER THICKNESS			10.50 IN		
POLICY OVERLAY THICKNESS			2.50 IN		

RIGID PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	5.02	23.98	23.98
Worksheet Construction Type is Reconstruction		The Pavement Type is	JPCP

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT		UNIT PRICE		COST
JPC PAVEMENT	(10.50")	3,040	SQ YD		$68.74	/ SQ YD	$208,970
PAVEMENT REINFORCEMENT		0	SQ YD		$22.00	/ SQ YD	$0
STABILIZED SUBBASE	(4.00")	0	SQ YD	*	$19.00	/ SQ YD	$0
PCC SHOULDERS		0	SQ YD		$40.00	/ SQ YD	$0
CURB & GUTTER		2,280	LIN FT	*	$30.00	/ LIN FT	$68,400
SUBBASE GRAN MATL TY C	(~ 0.00")	0	TONS		$25.00	/ TON	$0
IMPROVED SUBGRADE:	Aggregate Width = 50.0'	3,167	SQ YD		$7.00	/ SQ YD	$22,169
Reserved For User Supplied Item		0	UNITS		$0.00	/ UNITS	$0
Reserved For User Supplied Item		0	UNITS		$0.00	/ UNITS	$0
PAVEMENT REMOVAL		3,040	SQ YD		$15.00	/ SQ YD	$45,600
SHOULDER REMOVAL		0	SQ YD		$0.00	/ SQ YD	$0

Note: * Denotes User Supplied Quantity

RIGID CONSTRUCTION INITIAL COST	$345,139
RIGID CONSTRUCTION ANNUAL COST PER MILE	$130,393

MAINTENANCE COSTS:

ITEM	THICKNESS		MATERIAL	T	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY					$0.00	/ LANE-MILE / YEAR
HMA POLICY OVERLAY	(2.50")			2.50		
HMA POLICY OVERLAY PVMT	(2.50")	1.0087		2.50	$15.87	/ SQ YD
HMA SURFACE MIX	(1.50")	1.0052	Surface Mix	1.50	$9.64	/ SQ YD
HMA BINDER MIX	(1.00")	1.0139	eling Binder Mix	1.00	$6.23	/ SQ YD
HMA POLICY OVERLAY SHLD	(2.50")		Shoulder Mix	2.50	$10.08	/ SQ YD
CLASS A PAVEMENT PATCHING					$195.00	/ SQ YD
CLASS B PAVEMENT PATCHING					$150.00	/ SQ YD
CLASS C SHOULDER PATCHING					$145.00	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA Surf)			Surface Mix	1.50	$79.59	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")			Surface Mix	2.50	$85.98	/ SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL					$2.00	/ LIN FT
CENTERLINE JOINT ROUT & SEAL					$2.00	/ LIN FT
REFLECTIVE TRANSVERSE CRACK ROUT & SEAL					$2.00	/ LIN FT
RANDOM CRACK ROUT & SEAL	(100% Rehab = 100.00' / Station / Lane)				$2.00	/ LIN FT

RIGID TOTAL LIFE-CYCLE COST	$397,238
RIGID TOTAL ANNUAL COST PER MILE	$150,076

LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : **4/20/17 2:04 PM**

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	$345,139	$338,817
		ANNUAL COST PER MILE	$130,393	$128,005
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	$52,099	$89,489
		ANNUAL COST PER MILE	$19,683	$33,809
TOTAL	LIFE-CYCLE COST	PRESENT WORTH	$397,238	$428,306
		ANNUAL COST PER MILE	$150,076	$161,814

LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	==========>	**JPCP**	**$150,076**	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	**HMA**	**$161,814**	7.8%

S:\GEN\WPDOCS\Pavement Designs\D-1\IL 43 - over US 12 & US 20 - 60R49\Pavement Design Files\[IL 43-DOT Mech Pvmt Dgn LCCA 09-05-13.xlsm]PDFSheets

FULL-DEPTH HMA PAVEMENT
HMA OVERLAY OF RUBBLIZED PCC PAVEMENT
Figure 54-7.C
STANDARD DESIGN

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST		COST	PRESENT WORTH
YEAR 5								
	LONG SHLD JT R&S	100.00%	2,280	LIN FT	$2.00		$4,560	
	CNTR LINE JOINT R&S	100.00%	1,140	LIN FT	$2.00		$2,280	
	RNDM / THRM CRACK R&S	50.00%	1,254	LIN FT	$2.00		$2,508	
	PD PVMT PATCH M&F SURF	0.10%	3	SQ YD	$82.79		$248	
	PWFn =	0.8626		PW =	0.8626	X	$9,596	$8,278
YEAR 10								
	LONG SHLD JT R&S	100.00%	2,280	LIN FT	$2.00		$4,560	
	CNTR LINE JOINT R&S	100.00%	1,140	LIN FT	$2.00		$2,280	
	RNDM / THRM CRACK R&S	50.00%	1,254	LIN FT	$2.00		$2,508	
	PD PVMT PATCH M&F SURF	0.50%	15	SQ YD	$82.79		$1,242	
	PWFn =	0.7441		PW =	0.7441	X	$10,590	$7,880
YEAR 15								
	MILL PVMT & SHLD 2.00"	100.00%	3,040	SQ YD	$3.00		$9,120	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	30	SQ YD	$82.28		$2,468	
	HMA OVERLAY PVMT 2.00"	100.00%	3,040	SQ YD	$12.88		$39,143	
	HMA OVERLAY SHLD 2.00 "	100.00%	0	SQ YD	$8.06		$0	
	PWFn =	0.6419		PW =	0.6419	X	$50,731	$32,562
YEAR 20								
	LONG SHLD JT R&S	100.00%	2,280	LIN FT	$2.00		$4,560	
	CNTR LINE JOINT R&S	100.00%	1,140	LIN FT	$2.00		$2,280	
	RNDM / THRM CRACK R&S	50.00%	1,254	LIN FT	$2.00		$2,508	
	PD PVMT PATCH M&F SURF	0.10%	3	SQ YD	$82.79		$248	
	PWFn =	0.5537		PW =	0.5537	X	$9,596	$5,313
YEAR 25								
	LONG SHLD JT R&S	100.00%	2,280	LIN FT	$2.00		$4,560	
	CNTR LINE JOINT R&S	100.00%	1,140	LIN FT	$2.00		$2,280	
	RNDM / THRM CRACK R&S	50.00%	1,254	LIN FT	$2.00		$2,508	
	PD PVMT PATCH M&F SURF	0.50%	15	SQ YD	$82.79		$1,242	
	PWFn =	0.4776		PW =	0.4776	X	$10,590	$5,058

HMA_SD

YEAR 30	NON-INTERSTATE							
	MILL PVMT & SHLD 2.00"	100.00%	3,040	SQ YD	$3.00		$9,120	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	61	SQ YD	$82.28		$5,019	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	0	SQ YD	$78.06		$0	
	HMA OVERLAY PVMT 2.25 "	100.00%	3,040	SQ YD	$14.31		$43,489	
	HMA OVERLAY SHLD 2.25 "	100.00%	0	SQ YD	$9.07		$0	
	PWFn =	0.4120		PW =	0.4120	X	$57,628	$23,742
YEAR 35								
	LONG SHLD JT R&S	100.00%	2,280	LIN FT	$2.00		$4,560	
	CNTR LINE JOINT R&S	100.00%	1,140	LIN FT	$2.00		$2,280	
	RNDM / THRM CRACK R&S	50.00%	1,254	LIN FT	$2.00		$2,508	
	PD PVMT PATCH M&F SURF	0.10%	3	SQ YD	$82.79		$248	
	PWFn =	0.3554		PW =	0.3554	X	$9,596	$3,410
YEAR 40								
	LONG SHLD JT R&S	100.00%	2,280	LIN FT	$2.00		$4,560	
	CNTR LINE JOINT R&S	100.00%	1,140	LIN FT	$2.00		$2,280	
	RNDM / THRM CRACK R&S	50.00%	1,254	LIN FT	$2.00		$2,508	
	PD PVMT PATCH M&F SURF	0.50%	15	SQ YD	$82.79		$1,242	
	PWFn =	0.3066		PW =	0.3066	X	$10,590	$3,246
								$89,489
	ROUTINE MAINTENANCE ACTIVITY		0.43	Lane Miles	0.00		$0	$0
					MAINTENANCE LIFE-CYCLE COST			$89,489
45	YEAR LIFE CYCLE	CRFn = 0.0407852			MAINTENANCE ANNUAL COST PER MILE			$33,809

JPCP | MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE | 10/24/17

JOINTED PLAIN CONCRETE PAVEMENT
UNBONDED JOINTED PLAIN CONCRETE OVERLAY
Figure 54-7.A

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST		COST	PRESENT WORTH
YEAR 10								
	PAVEMENT PATCH CLASS B	0.10%	3	SQ YD	$150.00		$450	
	PWFn =	0.7441		PW =	0.7441	X	$450	$335
YEAR 15								
	PAVEMENT PATCH CLASS B	0.20%	6	SQ YD	$150.00		$900	
	PWFn =	0.6419		PW =	0.6419	X	$900	$578
YEAR 20								
	PAVEMENT PATCH CLASS B	2.00%	61	SQ YD	$150.00		$9,150	
	SHOULDER PATCH CLASS C	0.50%	0	SQ YD	$145.00		$0	
	LONGITUDINAL SHLD JT R&S	100.00%	2,280	LIN FT	$2.00		$4,560	
	CENTERLINE JT R&S	100.00%	1,140	LIN FT	$2.00		$2,280	
	PWFn =	0.5537		PW =	0.5537	X	$15,990	$8,853
YEAR 25								
	PAVEMENT PATCH CLASS B	3.00%	91	SQ YD	$150.00		$13,650	
	SHOULDER PATCH CLASS C	1.00%	0	SQ YD	$145.00		$0	
	PWFn =	0.4776		PW =	0.4776	X	$13,650	$6,519
YEAR 30	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	4.00%	122	SQ YD	$150.00		$18,300	
	SHOULDER PATCH CLASS C	1.50%	0	SQ YD	$145.00		$0	
	HMA POLICY OVERLAY 2.5" (PVMT)	100.00%	3,040	SQ YD	$15.87		$48,232	
	HMA POLICY OVERLAY 2.5" (SHLD)	100.00%	0	SQ YD	$10.08		$0	
	PWFn =	0.4120		PW =	0.4120	X	$66,532	$27,410
YEAR 35	NON-INTERSTATE							
	LONGITUDINAL SHLD JT R&S	100.00%	2,280	LIN FT	$2.00		$4,560	
	CENTERLINE JT R&S	100.00%	1,140	LIN FT	$2.00		$2,280	
	RANDOM CRACK R&S	50.00%	1,140	LIN FT	$2.00		$2,280	
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	730	LIN FT	$2.00		$1,460	
	PD PVMT PATCH M&F HMA 2.50"	0.10%	3	SQ YD	$85.98		$258	
	PWFn =	0.3554		PW =	0.3554	X	$10,838	$3,852
YEAR 40	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	0.50%	15	SQ YD	$150.00		$2,250	
	LONGITUDINAL SHLD JT R&S	100.00%	2,280	LIN FT	$2.00		$4,560	
	CENTERLINE JT R&S	100.00%	1,140	LIN FT	$2.00		$2,280	
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	1,094	LIN FT	$2.00		$2,188	
	RANDOM CRACK R&S	50.00%	1,140	LIN FT	$2.00		$2,280	
	PD PVMT PATCH M&F HMA 2.50"	0.50%	15	SQ YD	$85.98		$1,290	
	PWFn =	0.3066		PW =	0.3066	X	$14,848	$4,552
								$52,099
	ROUTINE MAINTENANCE ACTIVITY		0.43	Lane Miles	$0.00		$0	$0
							MAINTENANCE LIFE-CYCLE COST	$52,099
45	YEAR LIFE CYCLE	CRFn = 0.0407852					MAINTENANCE ANNUAL COST PER MILE	$19,683

BDE 5401 Template (Rev. 09/05/2013) **IDOT MECHANISTIC PAVEMENT DESIGN** Printed: 10/24/2017

PROJECT AND TRAFFIC INPUTS (Enter Data in Gray Shaded Cells)

Route: Pump Station Access Road
Section: 3128-Z-I-R&S
County: Cook
Location: at US 20/20 and IL 43 interchange
Comments: IL 43 over US 12/20 (95th St)
Design Date: 03/10/2016 ONP <-- BY
Modify Date: <-- BY

	ADT	Year
Current:	50	2017
Future:	50	2040

Facility Type: Unmarked State Route
# of Lanes = 2 or 3
Part of future 4 lanes or more ? No
One Way Street ? No
Road Class: IV
Subgrade Support Rating (SSR): Poor
Construction Year: 2019
Design Period (DP) = 20 years

	Structural Design Traffic			
	Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane
PV =	No Min	0	0.0%	P = 50%
SU =	No Min	25	50.0%	S = 50%
MU =	No Min	25	50.0%	M = 50%
Struct. Design ADT =		50	(2029)	

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT			RIGID PAVEMENT		
Cpv =	0.15		Cpv =	0.15	
Csu =	109.14		Csu =	129.58	
Cmu =	384.35		Cmu =	562.47	
TF flexible (Actual) =	0.12	(Actual ADT)	TF rigid (Actual) =	0.17	(Actual ADT)
TF flexible (Min) =	No Min	(Min ADT Fig. 54-2.C)	TF rigid (Min) =	No Min	(Min ADT Fig. 54-2.C)

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement

Use TF flexible = 0.50 Per BDE 54-5.01(i)-1g
PG Grade Lower Binder Lifts = PG 64-22 (Fig. 53-4.R)
Goto Map
HMA Mixture Temp. = 75.0 deg. F (Fig. 54-5.C)
Design HMA Mixture Modulus (E_{HMA}) = 690 ksi (Fig. 54-5.D)
Design HMA Strain (ε_{HMA}) = 147 (Fig. 54-5.E)
Goto Map
Full Depth HMA Design Thickness = 7.25 in. (Fig. 54-5.F)
Limiting Strain Criterion Thickness = 14.75 in. (Fig. 54-5.I)

Use Full-Depth HMA Thickness = 7.25 inches

JPC Pavement

Use TF rigid = 0.17
Edge Support = Tied Shoulder or C.&G.
Rigid Pavt Thick. = 999.00 in. (Fig. 54-4.E)
**** USE FIG. 54-4.H AND 54-4.I ****

CRC Pavement

Use TF rigid = 0.17
IBR value = 3
CRCP Thickness = 999.00 in. (Fig. 54-4.N)
TF MUST BE > 60 FOR CRCP

RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS

HMA Overlay of Rubblized PCC

Use TF flexible = 0.50
HMA Overlay Design Thickness = 4.75 in. (Fig. 54-5.U)
Goto Map
Limiting Strain Criterion Thickness = in. (Fig. 54-5.V)

Use HMA Overlay Thickness = 999.00 inches

Unbonded Concrete Overlay

Review 54-4.03 for limitations and special considerations.

JPCP Thickness = NA inches

CONTACT BMPR FOR ASSISTANCE

DESIGN TABLES FROM BDE MANUAL CHAPTER 54 - PAVEMENT DESIGN

Class I Roads	Class II Roads	Class III Roads	Class IV Roads
4 lanes or more Part of a future 4 lanes or more One-way Streets with ADT > 3500	2 lanes with ADT > 2000 One way Street with ADT <= 3500	2 Lanes (ADT 750 -2000)	2 Lanes (ADT < 750)

	Min. Str. Design Traffic (Fig 54-2.C)		
Facility Type	PV	SU	MU
Interstate or Freeway	0	500	1500
Other Marked State Route	0	250	750
Unmarked State Route	No Min	No Min	No Min

Class Table for One-Way Streets	
ADT	Class
0 - 3500	II
>3501	I

	Traffic Factor ESAL Coefficients			
	Rigid (Fig. 54-4.C)		Flexible (Fig. 54-5.B)	
Class	Csu	Cmu	Csu	Cmu
I	143.81	696.42	132.50	482.53
II	135.78	567.21	112.06	385.44
III	129.58	562.47	109.14	384.35
IV	129.58	562.47	109.14	384.35

Class Table for 2 or 3 lanes (not future 4 lane & not one-way street)	
ADT	Class
0 - 749	IV
750 - 2000	III
>2000	II

	Design Lane Distribution Factors For Structural Design Traffic (Fig. 54-2.B)					
	Rural			Urban		
Number of Lanes	P	S	M	P	S	M
1 Lane Ramp	100%	100%	100%	100%	100%	100%
2 or 3	50%	50%	50%	50%	50%	50%
4	32%	45%	45%	32%	45%	45%
6 or more	20%	40%	40%	8%	37%	37%

BDE 5401 Template (Rev. 09/05/2013) Printed: 10/24/2017

LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

FULL-DEPTH HMA PAVEMENT

Standard Design

ROUTE	**Pump Station Access Road**
SECTION	**3128-Z-I-R&S**
COUNTY	**Cook**
LOCATION	**at US 20/20 and IL 43 interchange**

FACILITY TYPE **NON-INTERSTATE**

PROJECT LENGTH			**500**	FT = = >	0.09 Miles
# OF CENTERLINES			**1**	CL	
# OF LANES			**1**	LANES	
# OF EDGES			**2**	EP	
LANE WIDTH - AVERAGE			**12**	FT	
SHOULDER WIDTH	HMA	Left	**6**	FT	
	HMA	Right	**6**	FT	
	Total Width of Paved Shoulders		**12**	FT	

PAVEMENT THICKNESS (FLEXIBLE)	**7.25** IN	**14.75** IN MAX	
SHOULDER THICKNESS	**8.00** IN	HMA_SD	**Standard Design**
POLICY OVERLAY THICKNESS	**2.25** IN		

FLEX PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	No Min	**0.12**	**0.12**

Read Me!

HMA COST PER TON	UNIT PRICE	
HMA SURFACE	**$143.19**	/ TON
HMA TOP BINDER	**$80.97**	/ TON
HMA LOWER BINDER	**$80.97**	/ TON
HMA BINDER (LEVELING)	**$80.97**	/ TON
HMA SHOULDER	**$72.00**	/ TON

INITIAL COSTS

ITEM	THICKNESS		100% QUANTITY	UNIT		UNIT PRICE		COST	
HMA PAVEMENT (FULL-DEPTH)	(7.25")	667	667	SQ YD	*	**$40.28**	/ SQ YD	$26,853	~
HMA SURFACE COURSE	(2.00")	1.0139	76	TONS		**$143.19**	/ TON	$0	
HMA TOP BINDER COURSE	(2.25")	1.0434	88	TONS		**$80.97**	/ TON	$0	
HMA LOWER BINDER COURSE	(3.00")	1.0799	121	TONS		**$80.97**	/ TON	$0	
HMA SHOULDER	(8.00")	667	299	TONS		**$72.00**	/ TON	$21,504	~
CURB & GUTTER			0	LIN FT		**$30.00**	/ LIN FT	$0	
SUBBASE GRAN MATL TY C (TONS)			0	TONS		**$25.00**	/ TON	$0	
IMPROVED SUBGRADE:	Aggregate	Width = 26.2'	1,456	SQ YD		**$7.00**	/ SQ YD	$10,192	
Reserved For User Supplied Item			0	**UNITS**		**$0.00**	/ UNITS	$0	
Reserved For User Supplied Item			0	**UNITS**		**$0.00**	/ UNITS	$0	
PAVEMENT REMOVAL			667	SQ YD		**$15.00**	/ SQ YD	$10,005	
SHOULDER REMOVAL			667	SQ YD		**$10.00**	/ SQ YD	$6,670	

Note: * Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST $75,224

FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE $32,398

MAINTENANCE COSTS:

ITEM		THICKNESS		MATERIAL	T	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY						**$0.00**	LANE-MILE / YEAR
HMA OVERLAY PVMT SURF		(2.00")	1.0139	Surface Mix	2.00	**$16.26**	/ SQ YD
HMA OVERLAY PVMT		(2.25")	1.0156		2.25	**$15.64**	/ SQ YD
HMA SURFACE MIX		(1.50")	1.0104	Surface Mix	1.50	**$12.15**	/ SQ YD
HMA BINDER MIX		(0.75")	1.0260	eling Binder Mix	0.75	**$3.49**	/ SQ YD
HMA OVERLAY SHLD	(Year 30)	(2.25")		Shoulder Mix	2.25	**$9.07**	/ SQ YD
HMA OVERLAY SHLD		(2.00")		Shoulder Mix	2.00	**$8.06**	/ SQ YD
MILLING (2.00 IN)					2.00	**$3.00**	/ SQ YD
PARTIAL DEPTH PVMT PATCH		(Mill & Fill Surf)		Surface Mix	2.00	**$86.04**	/ SQ YD

PARTIAL DEPTH SHLD PATCH	(Mill & Fill Surf)	Shoulder Mix	2.00	**$78.06**	/ SQ YD
PARTIAL DEPTH PVMT PATCH	(Mill & Fill +2.00 ")	Leveling Binder Mix	2.00	**$79.07**	/ SQ YD
PARTIAL DEPTH SHLD PATCH	(Mill & Fill +2.00 ")	Shoulder Mix	2.00	**$78.06**	/ SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL				**$2.00**	/ LIN FT
CENTERLINE JOINT ROUT & SEAL				**$2.00**	/ LIN FT
RANDOM / THERMAL CRACK ROUT & SEAL	(100% Rehab = 110.00' / Station / Lane)			**$2.00**	/ LIN FT

FLEXIBLE TOTAL LIFE-CYCLE COST	$109,899
FLEXIBLE TOTAL ANNUAL COST PER MILE	$47,333

PCC PAVEMENT — JPCP

ROUTE			Pump Station Access Road		
SECTION			3128-Z-I-R&S		
COUNTY			Cook		
LOCATION			at US 20/20 and IL 43 interchange		
FACILITY TYPE			NON-INTERSTATE		
PROJECT LENGTH			500 FT	= = >	0.09 Miles
# OF CENTERLINES			1 CL		
# OF LANES			1 LANES		
# OF EDGES			2 EP		
LANE WIDTH - AVERAGE			12 FT		
SHOULDER WIDTH	PCC	Left	6 FT		
	PCC	Right	6 FT		
	Total Width of Paved Shoulders		12 FT		
PAVEMENT THICKNESS (RIGID)		JPCP	999.00 IN	TIED SHLD	
SHOULDER THICKNESS			999.00 IN		
POLICY OVERLAY THICKNESS			2.50 IN		

RIGID PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	No Min	0.17	0.17
Worksheet Construction Type is Reconstruction		The Pavement Type is	JPCP

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE		COST
JPC PAVEMENT	(999.00")	667	SQ YD	$61.12	/ SQ YD	$40,767
PAVEMENT REINFORCEMENT		0	SQ YD	$22.00	/ SQ YD	$0
STABILIZED SUBBASE	(4.00")	833	SQ YD	$19.00	/ SQ YD	$15,827
PCC SHOULDERS		667	SQ YD	$40.00	/ SQ YD	$26,680
CURB & GUTTER		0	LIN FT	$30.00	/ LIN FT	$0
SUBBASE GRAN MATL TY C	(~ 1.86")	88	TONS	$25.00	/ TON	$2,200
IMPROVED SUBGRADE:	Aggregate Width = 25.0'	1,389	SQ YD	$7.00	/ SQ YD	$9,723
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0
PAVEMENT REMOVAL		667	SQ YD	$15.00	/ SQ YD	$10,005
SHOULDER REMOVAL		667	SQ YD	$10.00	/ SQ YD	$6,670

Note: * Denotes User Supplied Quantity

RIGID CONSTRUCTION INITIAL COST	$111,872
RIGID CONSTRUCTION ANNUAL COST PER MILE	$48,182

MAINTENANCE COSTS:

ITEM	THICKNESS		MATERIAL	T	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY					$0.00	/ LANE-MILE / YEAR
HMA POLICY OVERLAY	(2.50")			2.50		
HMA POLICY OVERLAY PVMT	(2.50")	1.0174		2.50	$16.81	/ SQ YD
HMA SURFACE MIX	(1.50")	1.0104	Surface Mix	1.50	$12.15	/ SQ YD
HMA BINDER MIX	(1.00")	1.0278	eling Binder Mix	1.00	$4.66	/ SQ YD
HMA POLICY OVERLAY SHLD	(2.50")		Shoulder Mix	2.50	$10.08	/ SQ YD
CLASS A PAVEMENT PATCHING					$195.00	/ SQ YD
CLASS B PAVEMENT PATCHING					$150.00	/ SQ YD
CLASS C SHOULDER PATCHING					$145.00	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA Surf)			Surface Mix	1.50	$82.03	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")			Surface Mix	2.50	$90.05	/ SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL					$2.00	/ LIN FT
CENTERLINE JOINT ROUT & SEAL					$2.00	/ LIN FT
REFLECTIVE TRANSVERSE CRACK ROUT & SEAL					$2.00	/ LIN FT
RANDOM CRACK ROUT & SEAL	(100% Rehab = 100.00' / Station / Lane)				$2.00	/ LIN FT

RIGID TOTAL LIFE-CYCLE COST	$129,460
RIGID TOTAL ANNUAL COST PER MILE	$55,757

LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : **4/20/17 2:14 PM**

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	$111,872	$75,224
		ANNUAL COST PER MILE	$48,182	$32,398
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	$17,588	$34,675
		ANNUAL COST PER MILE	$7,575	$14,934
TOTAL	LIFE-CYCLE COST	PRESENT WORTH	$129,460	$109,899
		ANNUAL COST PER MILE	$55,757	$47,333

LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	==========>	**HMA**	**$47,333**	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	**JPCP**	**$55,757**	**17.8%**

S:\GEN\WPDOCS\Pavement Designs\D-1\IL 43 - over US 12 & US 20 - 60R49\Pavement Design Files\[Pump Station Access Road-IDOT Mech Pvmt Dgn LCCA 09-0

FULL-DEPTH HMA PAVEMENT
HMA OVERLAY OF RUBBLIZED PCC PAVEMENT
Figure 54-7.C
STANDARD DESIGN

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST		COST	PRESENT WORTH
YEAR 5								
	LONG SHLD JT R&S	100.00%	1,000	LIN FT	$2.00		$2,000	
	CNTR LINE JOINT R&S	100.00%	500	LIN FT	$2.00		$1,000	
	RNDM / THRM CRACK R&S	50.00%	275	LIN FT	$2.00		$550	
	PD PVMT PATCH M&F SURF	0.10%	1	SQ YD	$86.04		$86	
	PWFn =	0.8626		PW =	0.8626	X	$3,636	$3,136
YEAR 10								
	LONG SHLD JT R&S	100.00%	1,000	LIN FT	$2.00		$2,000	
	CNTR LINE JOINT R&S	100.00%	500	LIN FT	$2.00		$1,000	
	RNDM / THRM CRACK R&S	50.00%	275	LIN FT	$2.00		$550	
	PD PVMT PATCH M&F SURF	0.50%	3	SQ YD	$86.04		$258	
	PWFn =	0.7441		PW =	0.7441	X	$3,808	$2,834
YEAR 15								
	MILL PVMT & SHLD 2.00"	100.00%	1,333	SQ YD	$3.00		$3,999	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	7	SQ YD	$79.07		$553	
	HMA OVERLAY PVMT 2.00"	100.00%	667	SQ YD	$16.26		$10,840	
	HMA OVERLAY SHLD 2.00 "	100.00%	667	SQ YD	$8.06		$5,376	
	PWFn =	0.6419		PW =	0.6419	X	$20,768	$13,330
YEAR 20								
	LONG SHLD JT R&S	100.00%	1,000	LIN FT	$2.00		$2,000	
	CNTR LINE JOINT R&S	100.00%	500	LIN FT	$2.00		$1,000	
	RNDM / THRM CRACK R&S	50.00%	275	LIN FT	$2.00		$550	
	PD PVMT PATCH M&F SURF	0.10%	1	SQ YD	$86.04		$86	
	PWFn =	0.5537		PW =	0.5537	X	$3,636	$2,013
YEAR 25								
	LONG SHLD JT R&S	100.00%	1,000	LIN FT	$2.00		$2,000	
	CNTR LINE JOINT R&S	100.00%	500	LIN FT	$2.00		$1,000	
	RNDM / THRM CRACK R&S	50.00%	275	LIN FT	$2.00		$550	
	PD PVMT PATCH M&F SURF	0.50%	3	SQ YD	$86.04		$258	
	PWFn =	0.4776		PW =	0.4776	X	$3,808	$1,819
	HMA_SD							
YEAR 30	NON-INTERSTATE							
	MILL PVMT & SHLD 2.00"	100.00%	1,333	SQ YD	$3.00		$3,999	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	13	SQ YD	$79.07		$1,028	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	7	SQ YD	$78.06		$546	
	HMA OVERLAY PVMT 2.25 "	100.00%	667	SQ YD	$15.64		$10,428	
	HMA OVERLAY SHLD 2.25 "	100.00%	667	SQ YD	$9.07		$6,048	
	PWFn =	0.4120		PW =	0.4120	X	$22,049	$9,084
YEAR 35								
	LONG SHLD JT R&S	100.00%	1,000	LIN FT	$2.00		$2,000	
	CNTR LINE JOINT R&S	100.00%	500	LIN FT	$2.00		$1,000	
	RNDM / THRM CRACK R&S	50.00%	275	LIN FT	$2.00		$550	
	PD PVMT PATCH M&F SURF	0.10%	1	SQ YD	$86.04		$86	
	PWFn =	0.3554		PW =	0.3554	X	$3,636	$1,292
YEAR 40								
	LONG SHLD JT R&S	100.00%	1,000	LIN FT	$2.00		$2,000	
	CNTR LINE JOINT R&S	100.00%	500	LIN FT	$2.00		$1,000	
	RNDM / THRM CRACK R&S	50.00%	275	LIN FT	$2.00		$550	
	PD PVMT PATCH M&F SURF	0.50%	3	SQ YD	$86.04		$258	
	PWFn =	0.3066		PW =	0.3066	X	$3,808	$1,167
								$34,675
	ROUTINE MAINTENANCE ACTIVITY		0.09	Lane Miles	0.00		$0	$0
					MAINTENANCE LIFE-CYCLE COST			$34,675
45	YEAR LIFE CYCLE	CRFn = 0.0407852			MAINTENANCE ANNUAL COST PER MILE			$14,934

JPCP | MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE | 10/24/17

JOINTED PLAIN CONCRETE PAVEMENT
UNBONDED JOINTED PLAIN CONCRETE OVERLAY
Figure 54-7.A

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST		COST	PRESENT WORTH
YEAR 10								
	PAVEMENT PATCH CLASS B	0.10%	1	SQ YD	$150.00		$150	
	PWFn =	0.7441		PW =	0.7441	X	$150	$112
YEAR 15								
	PAVEMENT PATCH CLASS B	0.20%	1	SQ YD	$150.00		$150	
	PWFn =	0.6419		PW =	0.6419	X	$150	$96
YEAR 20								
	PAVEMENT PATCH CLASS B	2.00%	13	SQ YD	$150.00		$1,950	
	SHOULDER PATCH CLASS C	0.50%	3	SQ YD	$145.00		$435	
	LONGITUDINAL SHLD JT R&S	100.00%	1,000	LIN FT	$2.00		$2,000	
	CENTERLINE JT R&S	100.00%	500	LIN FT	$2.00		$1,000	
	PWFn =	0.5537		PW =	0.5537	X	$5,385	$2,982
YEAR 25								
	PAVEMENT PATCH CLASS B	3.00%	20	SQ YD	$150.00		$3,000	
	SHOULDER PATCH CLASS C	1.00%	7	SQ YD	$145.00		$1,015	
	PWFn =	0.4776		PW =	0.4776	X	$4,015	$1,918
YEAR 30	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	4.00%	27	SQ YD	$150.00		$4,050	
	SHOULDER PATCH CLASS C	1.50%	10	SQ YD	$145.00		$1,450	
	HMA POLICY OVERLAY 2.5" (PVMT)	100.00%	667	SQ YD	$16.81		$11,209	
	HMA POLICY OVERLAY 2.5" (SHLD)	100.00%	667	SQ YD	$10.08		$6,720	
	PWFn =	0.4120		PW =	0.4120	X	$23,429	$9,652
YEAR 35	NON-INTERSTATE							
	LONGITUDINAL SHLD JT R&S	100.00%	1,000	LIN FT	$2.00		$2,000	
	CENTERLINE JT R&S	100.00%	500	LIN FT	$2.00		$1,000	
	RANDOM CRACK R&S	50.00%	250	LIN FT	$2.00		$500	
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	158	LIN FT	$2.00		$316	
	PD PVMT PATCH M&F HMA 2.50"	0.10%	1	SQ YD	$90.05		$90	
	PWFn =	0.3554		PW =	0.3554	X	$3,906	$1,388
YEAR 40	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	0.50%	3	SQ YD	$150.00		$450	
	LONGITUDINAL SHLD JT R&S	100.00%	1,000	LIN FT	$2.00		$2,000	
	CENTERLINE JT R&S	100.00%	500	LIN FT	$2.00		$1,000	
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	238	LIN FT	$2.00		$476	
	RANDOM CRACK R&S	50.00%	250	LIN FT	$2.00		$500	
	PD PVMT PATCH M&F HMA 2.50"	0.50%	3	SQ YD	$90.05		$270	
	PWFn =	0.3066		PW =	0.3066	X	$4,696	$1,440
								$17,588
	ROUTINE MAINTENANCE ACTIVITY		0.09	Lane Miles	$0.00		$0	$0
					MAINTENANCE LIFE-CYCLE COST			$17,588
45	YEAR LIFE CYCLE	CRFn = 0.0407852			MAINTENANCE ANNUAL COST PER MILE			$7,575

BDE 5401 Template (Rev. 09/05/2013)

IDOT MECHANISTIC PAVEMENT DESIGN

Printed: 10/24/2017

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: Ramp E/E2/F/G/G2/H/I/J
Section: 3128-Z-I-R&S
County: Cook
Location: at US 20/20 and IL 43 interchange

Comments: IL 43 over US 12/20 (95th St)
Ramp G/G2 Controls Design of the overall interchange
Design Date: 02/15/2017 ONP <-- BY
Modify Date: <-- BY

	ADT	Year
Current:	4,300	2014
Future:	8,500	2040

Facility Type: Other Marked State Route
** Ramp Design Fig. 54-1.B **
# of Lanes = 1 Lane Ramp
Crossroad? Other Marked State Route
# of Lanes = 4
Road Class: I
Subgrade Support Rating (SSR): Poor
Construction Year: 2019
Design Period (DP) = 20 years

	Structural Design Traffic: Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane
PV =	0	6,185	92.0%	P = 100%
SU =	250	269	4.0%	S = 100%
MU =	750	269	4.0%	M = 100%
Struct. Design ADT =		6,723	(2029)	

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT		RAMP DESIGN MIN	
Cpv =	0.15	0.15	32%
Csu =	132.5	112.06	45%
Cmu =	482.53	385.44	45%
TF flexible (Actual) =	3.33	(Actual ADT)	2.85
TF flexible (Min) =	2.85	(Min ADT Fig. 54-2.C)	

RIGID PAVEMENT		RAMP DESIGN MIN	
Cpv =	0.15	0.15	32%
Csu =	143.81	135.78	45%
Cmu =	696.42	567.21	45%
TF rigid (Actual) =	4.54	(Actual ADT)	4.13
TF rigid (Min) =	4.13	(Min ADT Fig. 54-2.C)	

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement

Use TF flexible = 3.33
PG Grade Lower Binder Lifts = PG 64-22 (Fig. 53-4.R)
Goto Map
HMA Mixture Temp. = 75.0 deg. F (Fig. 54-5.C)
Design HMA Mixture Modulus (E_{HMA}) = 690 ksi (Fig. 54-5.D)
Design HMA Strain (ε_{HMA}) = 85 (Fig. 54-5.E)
Goto Map
Full Depth HMA Design Thickness = 10.00 in. (Fig. 54-5.F)
Limiting Strain Criterion Thickness = 14.75 in. (Fig. 54-5.I)

Use Full-Depth HMA Thickness = 10.00 inches

JPC Pavement

Use TF rigid = 4.54
Edge Support = Tied Shoulder or C.&G.

Rigid Pavt Thick. = 9.00 in. (Fig. 54-4.E)

CRC Pavement

Use TF rigid = 4.54
IBR value = 3

CRCP Thickness = 8.00 in. (Fig. 54-4.M)

TF MUST BE > 60 FOR CRCP

RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS

HMA Overlay of Rubblized PCC

Use TF flexible = 3.33
HMA Overlay Design Thickness = 7.50 in. (Fig. 54-5.U)
Goto Map
Limiting Strain Criterion Thickness = in. (Fig. 54-5.V)

Use HMA Overlay Thickness = 999.00 inches

Unbonded Concrete Overlay

Review 54-4.03 for limitations and special considerations.

JPCP Thickness = NA inches

CONTACT BMPR FOR ASSISTANCE

DESIGN TABLES FROM BDE MANUAL CHAPTER 54 - PAVEMENT DESIGN

Class I Roads	Class II Roads	Class III Roads	Class IV Roads
4 lanes or more Part of a future 4 lanes or more One-way Streets with ADT > 3500	2 lanes with ADT > 2000 One way Street with ADT <= 3500	2 Lanes (ADT 750 -2000)	2 Lanes (ADT < 750)

	Min. Str. Design Traffic (Fig 54-2.C)		
Facility Type	PV	SU*	MU*
Interstate or Freeway	0	500	1500
Other Marked State Route	0	250	750
Unmarked State Route	0	250	750

* Use marked route minimums for unmarked routes (Fig. 54-1.B)

Class Table for One-Way Streets	
ADT	Class
0 - 3500	II
>3501	I

	Traffic Factor ESAL Coefficients			
	Rigid (Fig. 54-4.C)		Flexible (Fig. 54-5.B)	
Class	Csu	Cmu	Csu	Cmu
I	143.81	696.42	132.50	482.53
II	135.78	567.21	112.06	385.44
III	129.58	562.47	109.14	384.35
IV	129.58	562.47	109.14	384.35

Class Table for 2 or 3 lanes (not future 4 lane & not one-way street)	
ADT	Class
0 - 749	IV
750 - 2000	III
>2000	II

	Design Lane Distribution Factors For Structural Design Traffic (Fig. 54-2.B)					
	Rural			Urban		
Number of Lanes	P	S	M	P	S	M
1 Lane Ramp	100%	100%	100%	100%	100%	100%
2 or 3	50%	50%	50%	50%	50%	50%
4	32%	45%	45%	32%	45%	45%
6 or more	20%	40%	40%	8%	37%	37%

BDE 5401 Template (Rev. 09/05/2013) Printed: 10/24/2017

LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

FULL-DEPTH HMA PAVEMENT

Standard Design

ROUTE	**Ramp E/E2/F/G/G2/H/I/J**
SECTION	**3128-Z-I-R&S**
COUNTY	**Cook**
LOCATION	**at US 20/20 and IL 43 interchange**
FACILITY TYPE	**NON-INTERSTATE**

PROJECT LENGTH			**5330**	FT = = >	1.01 Miles
# OF CENTERLINES			**1**	CL	
# OF LANES			**1**	LANES	
# OF EDGES			**2**	EP	
LANE WIDTH - AVERAGE			**16**	FT	
SHOULDER WIDTH	HMA	Left	**4**	FT	
	HMA	Right	**6**	FT	
	Total Width of Paved Shoulders		**10**	FT	

PAVEMENT THICKNESS (FLEXIBLE)	**10.00**	IN	**14.75** IN MAX
SHOULDER THICKNESS	**8.00**	IN	HMA_SD **Standard Design**
POLICY OVERLAY THICKNESS	**2.25**	IN	

FLEX PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	2.85	**3.33**	**3.33**

Read Me!

HMA COST PER TON	UNIT PRICE	
HMA SURFACE	**$95.19**	/ TON
HMA TOP BINDER	**$86.00**	/ TON
HMA LOWER BINDER	**$66.95**	/ TON
HMA BINDER (LEVELING)	**$86.00**	/ TON
HMA SHOULDER	**$72.00**	/ TON

INITIAL COSTS

ITEM	THICKNESS		100% QUANTITY	UNIT		UNIT PRICE		COST	
HMA PAVEMENT (FULL-DEPTH)	(10.00")	9476	9,476	SQ YD	*	**$43.50**	/ SQ YD	$412,187	~
HMA SURFACE COURSE	(2.00")	1.0104	1,072	TONS		**$95.19**	/ TON	$0	
HMA TOP BINDER COURSE	(2.25")	1.0326	1,233	TONS		**$86.00**	/ TON	$0	
HMA LOWER BINDER COURSE	(5.75")	1.0742	3,278	TONS		**$66.95**	/ TON	$0	
HMA SHOULDER	(8.00")	5922	2,653	TONS		**$72.00**	/ TON	$191,027	~
CURB & GUTTER			0	LIN FT		**$30.00**	/ LIN FT	$0	
SUBBASE GRAN MATL TY C (TONS)			323	TONS		**$25.00**	/ TON	$8,075	
IMPROVED SUBGRADE:	Aggregate	Width = 28.7'	16,977	SQ YD		**$7.00**	/ SQ YD	$118,839	
Reserved For User Supplied Item			0	**UNITS**		**$0.00**	/ UNITS	$0	
Reserved For User Supplied Item			0	**UNITS**		**$0.00**	/ UNITS	$0	
PAVEMENT REMOVAL			9,476	SQ YD		**$15.00**	/ SQ YD	$142,140	
SHOULDER REMOVAL			5,922	SQ YD		**$10.00**	/ SQ YD	$59,220	

Note: * Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST	$931,488
FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE	$37,635

MAINTENANCE COSTS:

ITEM		THICKNESS		MATERIAL	T	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY						**$0.00**	LANE-MILE / YEAR
HMA OVERLAY PVMT SURF		(2.00")	1.0104	Surface Mix	2.00	**$10.77**	/ SQ YD
HMA OVERLAY PVMT		(2.25")	1.0117		2.25	**$11.74**	/ SQ YD
HMA SURFACE MIX		(1.50")	1.0078	Surface Mix	1.50	**$8.06**	/ SQ YD
HMA BINDER MIX		(0.75")	1.0195	eling Binder Mix	0.75	**$3.68**	/ SQ YD
HMA OVERLAY SHLD	(Year 30)	(2.25")		Shoulder Mix	2.25	**$9.07**	/ SQ YD
HMA OVERLAY SHLD		(2.00")		Shoulder Mix	2.00	**$8.06**	/ SQ YD
MILLING (2.00 IN)					2.00	**$3.00**	/ SQ YD
PARTIAL DEPTH PVMT PATCH		(Mill & Fill Surf)		Surface Mix	2.00	**$80.66**	/ SQ YD

PARTIAL DEPTH SHLD PATCH	(Mill & Fill Surf)	Shoulder Mix	2.00	**$78.06**	/ SQ YD
PARTIAL DEPTH PVMT PATCH	(Mill & Fill +2.00 ")	Leveling Binder Mix	2.00	**$79.63**	/ SQ YD
PARTIAL DEPTH SHLD PATCH	(Mill & Fill +2.00 ")	Shoulder Mix	2.00	**$78.06**	/ SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL				**$2.00**	/ LIN FT
CENTERLINE JOINT ROUT & SEAL				**$2.00**	/ LIN FT
RANDOM / THERMAL CRACK ROUT & SEAL	(100% Rehab = 110.00' / Station / Lane)			**$2.00**	/ LIN FT

FLEXIBLE TOTAL LIFE-CYCLE COST	$1,289,257
FLEXIBLE TOTAL ANNUAL COST PER MILE	$52,089

PCC PAVEMENT — JPCP

ROUTE			Ramp E/E2/F/G/G2/H/I/J		
SECTION			3128-Z-I-R&S		
COUNTY			Cook		
LOCATION			at US 20/20 and IL 43 interchange		
FACILITY TYPE			NON-INTERSTATE		
PROJECT LENGTH			5330 FT	= = >	1.01 Miles
# OF CENTERLINES			1 CL		
# OF LANES			1 LANES		
# OF EDGES			2 EP		
LANE WIDTH - AVERAGE			16 FT		
SHOULDER WIDTH	PCC	Left	4 FT		
	PCC	Right	6 FT		
	Total Width of Paved Shoulders		10 FT		
PAVEMENT THICKNESS (RIGID)		JPCP	9.00 IN	TIED SHLD	
SHOULDER THICKNESS			9.00 IN		
POLICY OVERLAY THICKNESS			2.50 IN		

RIGID PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	4.13	4.54	4.54
Worksheet Construction Type is Reconstruction		The Pavement Type is	JPCP

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE		COST
JPC PAVEMENT	(9.00")	9,476	SQ YD	$60.68	/ SQ YD	$575,004
PAVEMENT REINFORCEMENT		0	SQ YD	$22.00	/ SQ YD	$0
STABILIZED SUBBASE	(4.00")	11,252	SQ YD	$19.00	/ SQ YD	$213,788
PCC SHOULDERS		5,922	SQ YD	$40.00	/ SQ YD	$236,880
CURB & GUTTER		0	LIN FT	$30.00	/ LIN FT	$0
SUBBASE GRAN MATL TY C	(~ 1.80")	789	TONS	$25.00	/ TON	$19,725
IMPROVED SUBGRADE:	Aggregate Width = 27.0'	15,990	SQ YD	$7.00	/ SQ YD	$111,930
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0
PAVEMENT REMOVAL		9,476	SQ YD	$15.00	/ SQ YD	$142,140
SHOULDER REMOVAL		5,922	SQ YD	$10.00	/ SQ YD	$59,220

Note: * Denotes User Supplied Quantity

RIGID CONSTRUCTION INITIAL COST	$1,358,687
RIGID CONSTRUCTION ANNUAL COST PER MILE	$54,894

MAINTENANCE COSTS:

ITEM	THICKNESS		MATERIAL	T	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY					$0.00	/ LANE-MILE / YEAR
HMA POLICY OVERLAY	(2.50")			2.50		
HMA POLICY OVERLAY PVMT	(2.50")	1.0130		2.50	$12.97	/ SQ YD
HMA SURFACE MIX	(1.50")	1.0078	Surface Mix	1.50	$8.06	/ SQ YD
HMA BINDER MIX	(1.00")	1.0208	eling Binder Mix	1.00	$4.92	/ SQ YD
HMA POLICY OVERLAY SHLD	(2.50")		Shoulder Mix	2.50	$10.08	/ SQ YD
CLASS A PAVEMENT PATCHING					$195.00	/ SQ YD
CLASS B PAVEMENT PATCHING					$150.00	/ SQ YD
CLASS C SHOULDER PATCHING					$145.00	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA Surf)			Surface Mix	1.50	$78.00	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")			Surface Mix	2.50	$83.33	/ SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL					$2.00	/ LIN FT
CENTERLINE JOINT ROUT & SEAL					$2.00	/ LIN FT
REFLECTIVE TRANSVERSE CRACK ROUT & SEAL					$2.00	/ LIN FT
RANDOM CRACK ROUT & SEAL	(100% Rehab = 100.00' / Station / Lane)				$2.00	/ LIN FT

RIGID TOTAL LIFE-CYCLE COST	$1,557,861
RIGID TOTAL ANNUAL COST PER MILE	$62,942

LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : **4/20/17 2:28 PM**

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	$1,358,687	$931,488
		ANNUAL COST PER MILE	$54,894	$37,635
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	$199,174	$357,769
		ANNUAL COST PER MILE	$8,047	$14,455
TOTAL	LIFE-CYCLE COST	PRESENT WORTH	$1,557,861	$1,289,257
		ANNUAL COST PER MILE	$62,942	$52,089

LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	==========>	**HMA**	**$52,089**	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	**JPCP**	**$62,942**	**20.8%**

S:\GEN\WPDOCS\Pavement Designs\D-1\IL 43 - over US 12 & US 20 - 60R49\Pavement Design Files\[Ramps-IDOT Mech Pvmt Dgn LCCA 09-05-13.xlsm]PDFSheet

MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE

10/24/17

FULL-DEPTH HMA PAVEMENT
HMA OVERLAY OF RUBBLIZED PCC PAVEMENT
Figure 54-7.C
STANDARD DESIGN

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST		COST	PRESENT WORTH
YEAR 5								
	LONG SHLD JT R&S	100.00%	10,660	LIN FT	$2.00		$21,320	
	CNTR LINE JOINT R&S	100.00%	5,330	LIN FT	$2.00		$10,660	
	RNDM / THRM CRACK R&S	50.00%	2,932	LIN FT	$2.00		$5,864	
	PD PVMT PATCH M&F SURF	0.10%	9	SQ YD	$80.66		$726	
	PWFn =	0.8626		PW =	0.8626	X	$38,570	$33,271
YEAR 10								
	LONG SHLD JT R&S	100.00%	10,660	LIN FT	$2.00		$21,320	
	CNTR LINE JOINT R&S	100.00%	5,330	LIN FT	$2.00		$10,660	
	RNDM / THRM CRACK R&S	50.00%	2,932	LIN FT	$2.00		$5,864	
	PD PVMT PATCH M&F SURF	0.50%	47	SQ YD	$80.66		$3,791	
	PWFn =	0.7441		PW =	0.7441	X	$41,635	$30,980
YEAR 15								
	MILL PVMT & SHLD 2.00"	100.00%	15,398	SQ YD	$3.00		$46,194	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	95	SQ YD	$79.63		$7,565	
	HMA OVERLAY PVMT 2.00"	100.00%	9,476	SQ YD	$10.77		$102,074	
	HMA OVERLAY SHLD 2.00 "	100.00%	5,922	SQ YD	$8.06		$47,757	
	PWFn =	0.6419		PW =	0.6419	X	$203,590	$130,677
YEAR 20								
	LONG SHLD JT R&S	100.00%	10,660	LIN FT	$2.00		$21,320	
	CNTR LINE JOINT R&S	100.00%	5,330	LIN FT	$2.00		$10,660	
	RNDM / THRM CRACK R&S	50.00%	2,932	LIN FT	$2.00		$5,864	
	PD PVMT PATCH M&F SURF	0.10%	9	SQ YD	$80.66		$726	
	PWFn =	0.5537		PW =	0.5537	X	$38,570	$21,355
YEAR 25								
	LONG SHLD JT R&S	100.00%	10,660	LIN FT	$2.00		$21,320	
	CNTR LINE JOINT R&S	100.00%	5,330	LIN FT	$2.00		$10,660	
	RNDM / THRM CRACK R&S	50.00%	2,932	LIN FT	$2.00		$5,864	
	PD PVMT PATCH M&F SURF	0.50%	47	SQ YD	$80.66		$3,791	
	PWFn =	0.4776		PW =	0.4776	X	$41,635	$19,885
	HMA_SD							
YEAR 30	NON-INTERSTATE							
	MILL PVMT & SHLD 2.00"	100.00%	15,398	SQ YD	$3.00		$46,194	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	190	SQ YD	$79.63		$15,130	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	59	SQ YD	$78.06		$4,606	
	HMA OVERLAY PVMT 2.25 "	100.00%	9,476	SQ YD	$11.74		$111,252	
	HMA OVERLAY SHLD 2.25 "	100.00%	5,922	SQ YD	$9.07		$53,726	
	PWFn =	0.4120		PW =	0.4120	X	$230,908	$95,131
YEAR 35								
	LONG SHLD JT R&S	100.00%	10,660	LIN FT	$2.00		$21,320	
	CNTR LINE JOINT R&S	100.00%	5,330	LIN FT	$2.00		$10,660	
	RNDM / THRM CRACK R&S	50.00%	2,932	LIN FT	$2.00		$5,864	
	PD PVMT PATCH M&F SURF	0.10%	9	SQ YD	$80.66		$726	
	PWFn =	0.3554		PW =	0.3554	X	$38,570	$13,707
YEAR 40								
	LONG SHLD JT R&S	100.00%	10,660	LIN FT	$2.00		$21,320	
	CNTR LINE JOINT R&S	100.00%	5,330	LIN FT	$2.00		$10,660	
	RNDM / THRM CRACK R&S	50.00%	2,932	LIN FT	$2.00		$5,864	
	PD PVMT PATCH M&F SURF	0.50%	47	SQ YD	$80.66		$3,791	
	PWFn =	0.3066		PW =	0.3066	X	$41,635	$12,763
								$357,769
	ROUTINE MAINTENANCE ACTIVITY		1.01	Lane Miles	0.00		$0	$0
							MAINTENANCE LIFE-CYCLE COST	$357,769
45	YEAR LIFE CYCLE	CRFn = 0.0407852					MAINTENANCE ANNUAL COST PER MILE	$14,455

JPCP | MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE | 10/24/17

JOINTED PLAIN CONCRETE PAVEMENT
UNBONDED JOINTED PLAIN CONCRETE OVERLAY
Figure 54-7.A

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST		COST	PRESENT WORTH
YEAR 10								
	PAVEMENT PATCH CLASS B	0.10%	9	SQ YD	$150.00		$1,350	
	PWFn =	0.7441		PW =	0.7441	X	$1,350	$1,005
YEAR 15								
	PAVEMENT PATCH CLASS B	0.20%	19	SQ YD	$150.00		$2,850	
	PWFn =	0.6419		PW =	0.6419	X	$2,850	$1,829
YEAR 20								
	PAVEMENT PATCH CLASS B	2.00%	190	SQ YD	$150.00		$28,500	
	SHOULDER PATCH CLASS C	0.50%	30	SQ YD	$145.00		$4,350	
	LONGITUDINAL SHLD JT R&S	100.00%	10,660	LIN FT	$2.00		$21,320	
	CENTERLINE JT R&S	100.00%	5,330	LIN FT	$2.00		$10,660	
	PWFn =	0.5537		PW =	0.5537	X	$64,830	$35,895
YEAR 25								
	PAVEMENT PATCH CLASS B	3.00%	284	SQ YD	$150.00		$42,600	
	SHOULDER PATCH CLASS C	1.00%	59	SQ YD	$145.00		$8,555	
	PWFn =	0.4776		PW =	0.4776	X	$51,155	$24,432
YEAR 30	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	4.00%	379	SQ YD	$150.00		$56,850	
	SHOULDER PATCH CLASS C	1.50%	89	SQ YD	$145.00		$12,905	
	HMA POLICY OVERLAY 2.5" (PVMT)	100.00%	9,476	SQ YD	$12.97		$122,943	
	HMA POLICY OVERLAY 2.5" (SHLD)	100.00%	5,922	SQ YD	$10.08		$59,696	
	PWFn =	0.4120		PW =	0.4120	X	$252,394	$103,983
YEAR 35	NON-INTERSTATE							
	LONGITUDINAL SHLD JT R&S	100.00%	10,660	LIN FT	$2.00		$21,320	
	CENTERLINE JT R&S	100.00%	5,330	LIN FT	$2.00		$10,660	
	RANDOM CRACK R&S	50.00%	2,665	LIN FT	$2.00		$5,330	
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	2,272	LIN FT	$2.00		$4,544	
	PD PVMT PATCH M&F HMA 2.50"	0.10%	9	SQ YD	$83.33		$750	
	PWFn =	0.3554		PW =	0.3554	X	$42,604	$15,141
YEAR 40	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	0.50%	47	SQ YD	$150.00		$7,050	
	LONGITUDINAL SHLD JT R&S	100.00%	10,660	LIN FT	$2.00		$21,320	
	CENTERLINE JT R&S	100.00%	5,330	LIN FT	$2.00		$10,660	
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	3,408	LIN FT	$2.00		$6,816	
	RANDOM CRACK R&S	50.00%	2,665	LIN FT	$2.00		$5,330	
	PD PVMT PATCH M&F HMA 2.50"	0.50%	47	SQ YD	$83.33		$3,916	
	PWFn =	0.3066		PW =	0.3066	X	$55,092	$16,889
								$199,174
	ROUTINE MAINTENANCE ACTIVITY		1.01	Lane Miles	$0.00		$0	$0
							MAINTENANCE LIFE-CYCLE COST	$199,174
45	YEAR LIFE CYCLE	CRFn = 0.0407852					MAINTENANCE ANNUAL COST PER MILE	$8,047

BDE 5401 Template (Rev. 09/05/2013) **IDOT MECHANISTIC PAVEMENT DESIGN** Printed: 10/24/2017

PROJECT AND TRAFFIC INPUTS (Enter Data in Gray Shaded Cells)

Route: US 12/20 (95th Street) Comments: IL 43 over US 12/20 (95th St)
Section: 3128-Z-I-R&S
County: Cook Design Date: 02/15/2017 ONP <-- BY
Location: at IL 43 Modify Date: <-- BY

	ADT	Year
Current:	70,000	2014
Future:	75,000	2040

Facility Type: Other Marked State Route
# of Lanes = 4
Road Class: I
Subgrade Support Rating (SSR): Poor
Construction Year: 2019
Design Period (DP) = 20 years

	Structural Design Traffic: Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane
PV =	0	66,908	91.8%	P = 32%
SU =	250	2,988	4.1%	S = 45%
MU =	750	2,988	4.1%	M = 45%
Struct. Design ADT =		72,885	(2029)	

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT			RIGID PAVEMENT		
Cpv =	0.15		Cpv =	0.15	
Csu =	132.5		Csu =	143.81	
Cmu =	482.53		Cmu =	696.42	
TF flexible (Actual) =	16.61	(Actual ADT)	TF rigid (Actual) =	22.66	(Actual ADT)
TF flexible (Min) =	3.56	(Min ADT Fig. 54-2.C)	TF rigid (Min) =	5.02	(Min ADT Fig. 54-2.C)

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement

Use TF flexible = 16.61
PG Grade Lower Binder Lifts = PG 64-22 (Fig. 53-4.R)
Goto Map
HMA Mixture Temp. = 75.0 deg. F (Fig. 54-5.C)
Design HMA Mixture Modulus (E_{HMA}) = 690 ksi (Fig. 54-5.D)
Design HMA Strain (ε_{HMA}) = 54 (Fig. 54-5.E)
Goto Map
Full Depth HMA Design Thickness = 13.50 in. (Fig. 54-5.F)
Limiting Strain Criterion Thickness = 14.75 in. (Fig. 54-5.I)
Use Full-Depth HMA Thickness = 13.50 inches

JPC Pavement

Use TF rigid = 22.66
Edge Support = Tied Shoulder or C.&G.
Rigid Pavt Thick. = 10.50 in. (Fig. 54-4.E)

CRC Pavement

Use TF rigid = 22.66
IBR value = 3
CRCP Thickness = 10.00 in. (Fig. 54-4.M)

TF MUST BE > 60 FOR CRCP

RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS

HMA Overlay of Rubblized PCC

Use TF flexible = 16.61
HMA Overlay Design Thickness = 10.75 in. (Fig. 54-5.U)
Goto Map
Limiting Strain Criterion Thickness = in. (Fig. 54-5.V)
Use HMA Overlay Thickness = 999.00 inches

Unbonded Concrete Overlay

Review 54-4.03 for limitations and special considerations.

JPCP Thickness = NA inches

CONTACT BMPR FOR ASSISTANCE

DESIGN TABLES FROM BDE MANUAL CHAPTER 54 - PAVEMENT DESIGN

Class I Roads	Class II Roads	Class III Roads	Class IV Roads
4 lanes or more Part of a future 4 lanes or more One-way Streets with ADT > 3500	2 lanes with ADT > 2000 One way Street with ADT <= 3500	2 Lanes (ADT 750 -2000)	2 Lanes (ADT < 750)

	Min. Str. Design Traffic (Fig 54-2.C)		
Facility Type	PV	SU	MU
Interstate or Freeway	0	500	1500
Other Marked State Route	0	250	750
Unmarked State Route	No Min	No Min	No Min

Class Table for One-Way Streets	
ADT	Class
0 - 3500	II
>3501	I

	Traffic Factor ESAL Coefficients			
	Rigid (Fig. 54-4.C)		Flexible (Fig. 54-5.B)	
Class	Csu	Cmu	Csu	Cmu
I	143.81	696.42	132.50	482.53
II	135.78	567.21	112.06	385.44
III	129.58	562.47	109.14	384.35
IV	129.58	562.47	109.14	384.35

Class Table for 2 or 3 lanes (not future 4 lane & not one-way street)	
ADT	Class
0 - 749	IV
750 - 2000	III
>2000	II

	Design Lane Distribution Factors For Structural Design Traffic (Fig. 54-2.B)					
	Rural			Urban		
Number of Lanes	P	S	M	P	S	M
1 Lane Ramp	100%	100%	100%	100%	100%	100%
2 or 3	50%	50%	50%	50%	50%	50%
4	32%	45%	45%	32%	45%	45%
6 or more	20%	40%	40%	8%	37%	37%

BDE 5401 Template (Rev. 09/05/2013) Printed: 10/24/2017

LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

FULL-DEPTH HMA PAVEMENT

Standard Design

ROUTE	**Job Route**
SECTION	**Job Section**
COUNTY	**Job County**
LOCATION	**Job Location**

FACILITY TYPE: **INTERSTATE**

PROJECT LENGTH			**1000**	FT = = >	0.19 Miles
# OF CENTERLINES			**2**	CL	
# OF LANES			**4**	LANES	
# OF EDGES			**4**	EP	
LANE WIDTH - AVERAGE			**12**	FT	
SHOULDER WIDTH	HMA	Inside	**6**	FT	
	HMA	Outside	**10**	FT	
	Total Width of Paved Shoulders		**32**	FT	

PAVEMENT THICKNESS (FLEXIBLE)	**12.00**	IN	**17.00** IN MAX
SHOULDER THICKNESS	**8.00**	IN	HMA_SD **Standard Design**
POLICY OVERLAY THICKNESS	**3.75**	IN	

FLEX PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	7.11	**1.00**	**7.11**

Read Me!

HMA COST PER TON	UNIT PRICE	
HMA SURFACE	**$95.00**	/ TON
HMA TOP BINDER	**$95.00**	/ TON
HMA LOWER BINDER	**$80.00**	/ TON
HMA BINDER (LEVELING)	**$85.00**	/ TON
HMA SHOULDER	**$72.00**	/ TON

INITIAL COSTS

ITEM	THICKNESS		100% QUANTITY	UNIT	UNIT PRICE		COST	
HMA PAVEMENT (FULL-DEPTH)	(12.00")	5333	5,333	SQ YD	**$59.62**	/ SQ YD	$317,988	~
HMA SURFACE COURSE	(2.00")	1.0069	601	TONS	**$95.00**	/ TON	$0	
HMA TOP BINDER COURSE	(2.25")	1.0217	687	TONS	**$95.00**	/ TON	$0	
HMA LOWER BINDER COURSE	(7.75")	1.0564	2,445	TONS	**$80.00**	/ TON	$0	
HMA SHOULDER	(8.00")	3556	1,593	TONS	**$72.00**	/ TON	$114,688	~
CURB & GUTTER			0	LIN FT	**$30.00**	/ LIN FT	$0	
SUBBASE GRAN MATL TY C (TONS)			499	TONS	**$25.00**	/ TON	$12,475	
IMPROVED SUBGRADE:	Aggregate	Width = 86.0'	9,556	SQ YD	**$7.00**	/ SQ YD	$66,892	
Reserved For User Supplied Item			0	**UNITS**	**$0.00**	/ UNITS	$0	
Reserved For User Supplied Item			0	**UNITS**	**$0.00**	/ UNITS	$0	
PAVEMENT REMOVAL			5,333	SQ YD	**$0.00**	/ SQ YD	$0	
SHOULDER REMOVAL			3,556	SQ YD	**$0.00**	/ SQ YD	$0	

Note: * Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST	$512,043
FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE	$110,266

MAINTENANCE COSTS:

ITEM		THICKNESS		MATERIAL	T	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY						**$0.00**	LANE-MILE / YEAR
HMA OVERLAY PVMT SURF		(2.00")	1.0069	Surface Mix	2.00	**$10.71**	/ SQ YD
HMA OVERLAY PVMT		(3.75")	1.0130		3.75	**$20.21**	/ SQ YD
HMA SURFACE MIX		(1.50")	1.0052	Surface Mix	1.50	**$8.02**	/ SQ YD
HMA BINDER MIX		(2.25")	1.0182	Top Binder Mix	2.25	**$12.19**	/ SQ YD
HMA OVERLAY SHLD	(Year 30)	(1.75")		Shoulder Mix	1.75	**$7.06**	/ SQ YD
HMA OVERLAY SHLD		(2.00")		Shoulder Mix	2.00	**$8.06**	/ SQ YD
MILLING (2.00 IN)					2.00	**$3.00**	/ SQ YD
PARTIAL DEPTH PVMT PATCH		(Mill & Fill Surf)		Surface Mix	2.00	**$80.64**	/ SQ YD

PARTIAL DEPTH SHLD PATCH	(Mill & Fill Surf)	Shoulder Mix	2.00	**$78.06**	/ SQ YD
PARTIAL DEPTH PVMT PATCH	(Mill & Fill +2.00 ")	Leveling Binder Mix	2.00	**$79.52**	/ SQ YD
PARTIAL DEPTH SHLD PATCH	(Mill & Fill +2.00 ")	Shoulder Mix	2.00	**$78.06**	/ SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL				**$2.00**	/ LIN FT
CENTERLINE JOINT ROUT & SEAL				**$2.00**	/ LIN FT
RANDOM / THERMAL CRACK ROUT & SEAL	(100% Rehab = 110.00' / Station / Lane)			**$2.00**	/ LIN FT

FLEXIBLE TOTAL LIFE-CYCLE COST	$711,101
FLEXIBLE TOTAL ANNUAL COST PER MILE	$153,133

PCC PAVEMENT — JPCP

ROUTE			Job Route		
SECTION			Job Section		
COUNTY			Job County		
LOCATION			Job Location		
FACILITY TYPE			INTERSTATE		
PROJECT LENGTH			1000 FT	= = >	0.19 Miles
# OF CENTERLINES			2 CL		
# OF LANES			4 LANES		
# OF EDGES			4 EP		
LANE WIDTH - AVERAGE			12 FT		
SHOULDER WIDTH	PCC	Inside	6 FT		
	PCC	Outside	10 FT		
	Total Width of Paved Shoulders		32 FT		
PAVEMENT THICKNESS (RIGID)		JPCP	10.00 IN	TIED SHLD	
SHOULDER THICKNESS			10.00 IN		
POLICY OVERLAY THICKNESS			3.75 IN		

RIGID PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	10.05	1.00	10.05
Worksheet Construction Type is New Construction		The Pavement Type is	JPCP

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE		COST
JPC PAVEMENT	(10.00")	5,333	SQ YD	$50.00	/ SQ YD	$266,650
PAVEMENT REINFORCEMENT		0	SQ YD	$22.00	/ SQ YD	$0
STABILIZED SUBBASE	(4.00")	6,000	SQ YD	$19.00	/ SQ YD	$114,000
PCC SHOULDERS		3,556	SQ YD	$40.00	/ SQ YD	$142,240
CURB & GUTTER		0	LIN FT	$30.00	/ LIN FT	$0
SUBBASE GRAN MATL TY C	(~ 3.48")	418	TONS	$25.00	/ TON	$10,450
IMPROVED SUBGRADE:	Aggregate Width = 82.0'	9,111	SQ YD	$7.00	/ SQ YD	$63,777
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0
PAVEMENT REMOVAL		5,333	SQ YD	$0.00	/ SQ YD	$0
SHOULDER REMOVAL		3,556	SQ YD	$0.00	/ SQ YD	$0

Note: * Denotes User Supplied Quantity

RIGID CONSTRUCTION INITIAL COST	$597,117
RIGID CONSTRUCTION ANNUAL COST PER MILE	$128,587

MAINTENANCE COSTS:

ITEM	THICKNESS		MATERIAL	T	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY					$0.00	/ LANE-MILE / YEAR
HMA POLICY OVERLAY	(3.75")			3.75		
HMA POLICY OVERLAY PVMT	(3.75")	1.0130		3.75	$20.21	/ SQ YD
HMA SURFACE MIX	(1.50")	1.0052	Surface Mix	1.50	$8.02	/ SQ YD
HMA BINDER MIX	(2.25")	1.0182	Top Binder Mix	2.25	$12.19	/ SQ YD
HMA POLICY OVERLAY SHLD	(3.75")		Shoulder Mix	3.75	$15.12	/ SQ YD
CLASS A PAVEMENT PATCHING					$195.00	/ SQ YD
CLASS B PAVEMENT PATCHING					$150.00	/ SQ YD
CLASS C SHOULDER PATCHING					$145.00	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA Surf)			Surface Mix	1.50	$77.98	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 1.50")			Surface Mix	1.50	$77.98	/ SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL					$2.00	/ LIN FT
CENTERLINE JOINT ROUT & SEAL					$2.00	/ LIN FT
REFLECTIVE TRANSVERSE CRACK ROUT & SEAL					$2.00	/ LIN FT
RANDOM CRACK ROUT & SEAL	(100% Rehab = 100.00' / Station / Lane)				$2.00	/ LIN FT

RIGID TOTAL LIFE-CYCLE COST	$727,263
RIGID TOTAL ANNUAL COST PER MILE	$156,613

LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : **9/5/13 9:40 AM**

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	$597,117	$512,043
		ANNUAL COST PER MILE	$128,587	$110,266
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	$130,146	$199,058
		ANNUAL COST PER MILE	$28,026	$42,866
TOTAL	LIFE-CYCLE COST	PRESENT WORTH	$727,263	$711,101
		ANNUAL COST PER MILE	$156,613	$153,133

LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	==========>	**HMA**	**$153,133**	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	**JPCP**	**$156,613**	2.3%

S:\GEN\WPDOCS\Pavement Designs\D-1\IL 43 - over US 12 & US 20 - 60R49\Pavement Design Files\[US 12_20-IDOT Mech Pvmt Dgn LCCA 09-05-13.xlsm]PDFSh

FULL-DEPTH HMA PAVEMENT
HMA OVERLAY OF RUBBLIZED PCC PAVEMENT
Figure 54-7.C
STANDARD DESIGN

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST		COST	PRESENT WORTH
YEAR 5								
	LONG SHLD JT R&S	100.00%	4,000	LIN FT	$2.00		$8,000	
	CNTR LINE JOINT R&S	100.00%	2,000	LIN FT	$2.00		$4,000	
	RNDM / THRM CRACK R&S	50.00%	2,200	LIN FT	$2.00		$4,400	
	PD PVMT PATCH M&F SURF	0.10%	5	SQ YD	$80.64		$403	
	PWFn =	0.8626		PW =	0.8626	X	$16,803	$14,494
YEAR 10								
	LONG SHLD JT R&S	100.00%	4,000	LIN FT	$2.00		$8,000	
	CNTR LINE JOINT R&S	100.00%	2,000	LIN FT	$2.00		$4,000	
	RNDM / THRM CRACK R&S	50.00%	2,200	LIN FT	$2.00		$4,400	
	PD PVMT PATCH M&F SURF	0.50%	27	SQ YD	$80.64		$2,177	
	PWFn =	0.7441		PW =	0.7441	X	$18,577	$13,823
YEAR 15								
	MILL PVMT & SHLD 2.00"	100.00%	8,889	SQ YD	$3.00		$26,667	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	53	SQ YD	$79.52		$4,215	
	HMA OVERLAY PVMT 2.00"	100.00%	5,333	SQ YD	$10.71		$57,141	
	HMA OVERLAY SHLD 2.00 "	100.00%	3,556	SQ YD	$8.06		$28,672	
	PWFn =	0.6419		PW =	0.6419	X	$116,695	$74,902
YEAR 20								
	LONG SHLD JT R&S	100.00%	4,000	LIN FT	$2.00		$8,000	
	CNTR LINE JOINT R&S	100.00%	2,000	LIN FT	$2.00		$4,000	
	RNDM / THRM CRACK R&S	50.00%	2,200	LIN FT	$2.00		$4,400	
	PD PVMT PATCH M&F SURF	0.10%	5	SQ YD	$80.64		$403	
	PWFn =	0.5537		PW =	0.5537	X	$16,803	$9,303
YEAR 25								
	LONG SHLD JT R&S	100.00%	4,000	LIN FT	$2.00		$8,000	
	CNTR LINE JOINT R&S	100.00%	2,000	LIN FT	$2.00		$4,000	
	RNDM / THRM CRACK R&S	50.00%	2,200	LIN FT	$2.00		$4,400	
	PD PVMT PATCH M&F SURF	0.50%	27	SQ YD	$80.64		$2,177	
	PWFn =	0.4776		PW =	0.4776	X	$18,577	$8,872

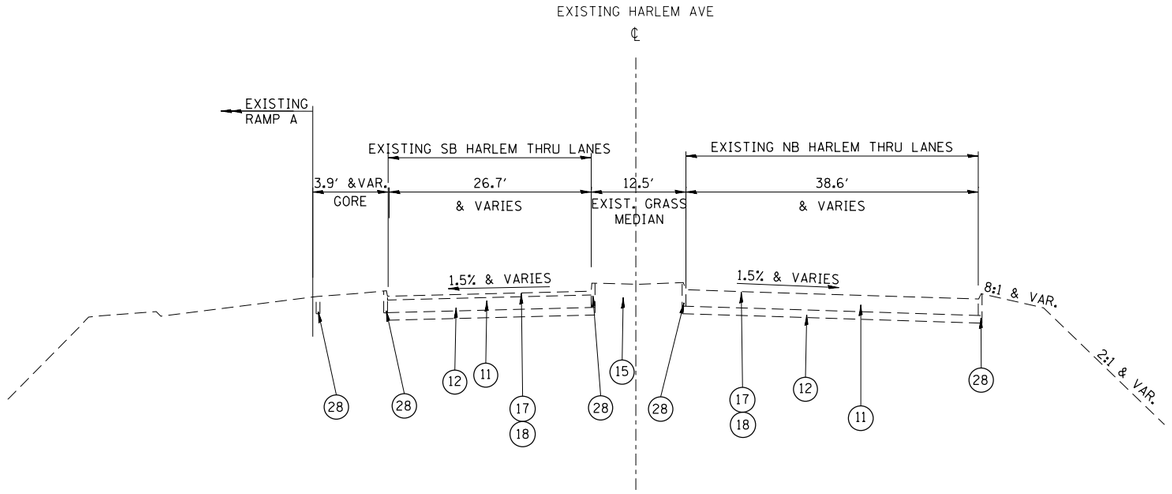
HMA_SD

YEAR 30	INTERSTATE							
	MILL PVMT ONLY 2.00"	100.00%	5,333	SQ YD	$3.00		$15,999	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	107	SQ YD	$79.52		$8,509	
	PD SHLD PATCH M&F SURF 2.00"	1.00%	36	SQ YD	$78.06		$2,810	
	HMA OVERLAY PVMT 3.75 "	100.00%	5,333	SQ YD	$20.21		$107,785	
	HMA OVERLAY SHLD 1.75 "	100.00%	3,556	SQ YD	$7.06		$25,088	
	PWFn =	0.4120		PW =	0.4120	X	$160,191	$65,997
YEAR 35								
	LONG SHLD JT R&S	100.00%	4,000	LIN FT	$2.00		$8,000	
	CNTR LINE JOINT R&S	100.00%	2,000	LIN FT	$2.00		$4,000	
	RNDM / THRM CRACK R&S	50.00%	2,200	LIN FT	$2.00		$4,400	
	PD PVMT PATCH M&F SURF	0.10%	5	SQ YD	$80.64		$403	
	PWFn =	0.3554		PW =	0.3554	X	$16,803	$5,972
YEAR 40								
	LONG SHLD JT R&S	100.00%	4,000	LIN FT	$2.00		$8,000	
	CNTR LINE JOINT R&S	100.00%	2,000	LIN FT	$2.00		$4,000	
	RNDM / THRM CRACK R&S	50.00%	2,200	LIN FT	$2.00		$4,400	
	PD PVMT PATCH M&F SURF	0.50%	27	SQ YD	$80.64		$2,177	
	PWFn =	0.3066		PW =	0.3066	X	$18,577	$5,695
								$199,058
	ROUTINE MAINTENANCE ACTIVITY		0.76	Lane Miles	0.00		$0	$0
							MAINTENANCE LIFE-CYCLE COST	$199,058
45	YEAR LIFE CYCLE	CRFn = 0.0407852					MAINTENANCE ANNUAL COST PER MILE	$42,866

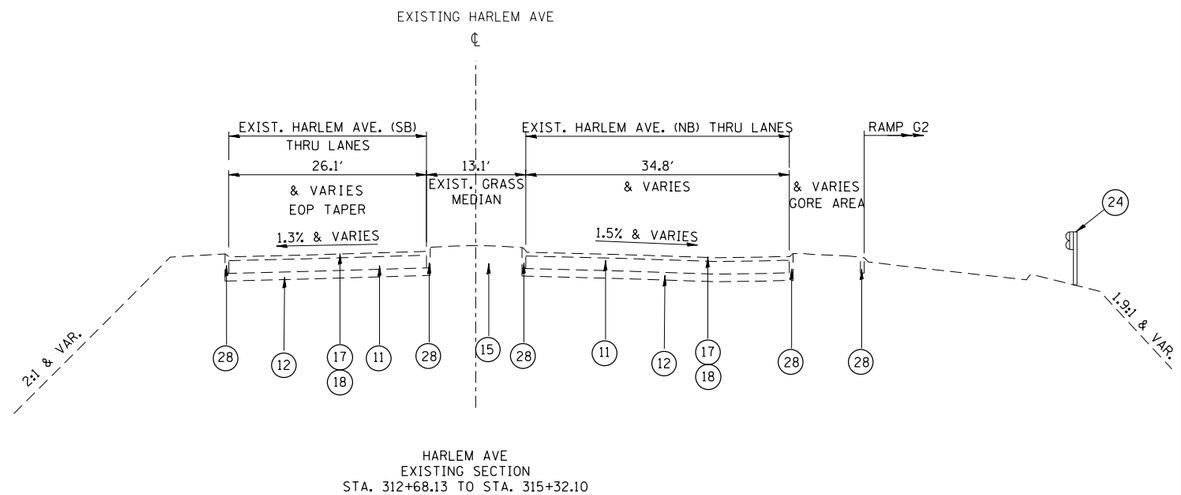
JPCP | MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE | 10/24/17

JOINTED PLAIN CONCRETE PAVEMENT
UNBONDED JOINTED PLAIN CONCRETE OVERLAY
Figure 54-7.A

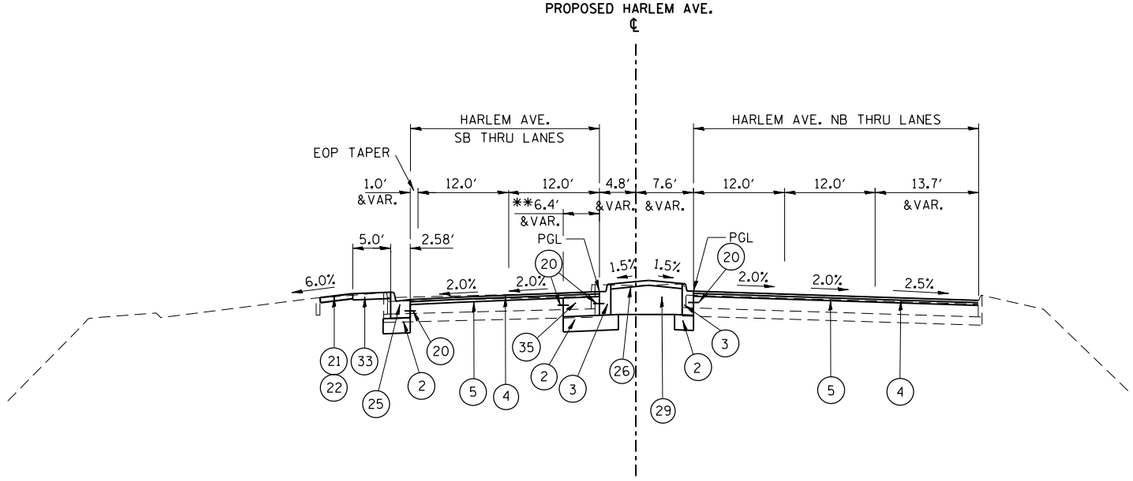
MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST		COST	PRESENT WORTH
YEAR 10								
	PAVEMENT PATCH CLASS B	0.10%	5	SQ YD	$150.00		$750	
	PWFn =	0.7441		PW =	0.7441	X	$750	$558
YEAR 15								
	PAVEMENT PATCH CLASS B	0.20%	11	SQ YD	$150.00		$1,650	
	PWFn =	0.6419		PW =	0.6419	X	$1,650	$1,059
YEAR 20								
	PAVEMENT PATCH CLASS B	2.00%	107	SQ YD	$150.00		$16,050	
	SHOULDER PATCH CLASS C	0.50%	18	SQ YD	$145.00		$2,610	
	LONGITUDINAL SHLD JT R&S	100.00%	4,000	LIN FT	$2.00		$8,000	
	CENTERLINE JT R&S	100.00%	2,000	LIN FT	$2.00		$4,000	
	PWFn =	0.5537		PW =	0.5537	X	$30,660	$16,976
YEAR 25								
	PAVEMENT PATCH CLASS B	3.00%	160	SQ YD	$150.00		$24,000	
	SHOULDER PATCH CLASS C	1.00%	36	SQ YD	$145.00		$5,220	
	PWFn =	0.4776		PW =	0.4776	X	$29,220	$13,956
YEAR 30	INTERSTATE							
	PAVEMENT PATCH CLASS B	4.00%	213	SQ YD	$150.00		$31,950	
	SHOULDER PATCH CLASS C	1.50%	53	SQ YD	$145.00		$7,685	
	HMA POLICY OVERLAY 3.75" (PVMT)	100.00%	5,333	SQ YD	$20.21		$107,785	
	HMA POLICY OVERLAY 3.75" (SHLD)	100.00%	3,556	SQ YD	$15.12		$53,760	
	PWFn =	0.4120		PW =	0.4120	X	$201,180	$82,883
YEAR 35	INTERSTATE							
	LONGITUDINAL SHLD JT R&S	100.00%	4,000	LIN FT	$2.00		$8,000	
	CENTERLINE JT R&S	100.00%	2,000	LIN FT	$2.00		$4,000	
	RANDOM CRACK R&S	50.00%	2,000	LIN FT	$2.00		$4,000	
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	1,286	LIN FT	$2.00		$2,572	
	PD PVMT PATCH M&F HMA SURF 1.50"	0.10%	5	SQ YD	$77.98		$390	
	PWFn =	0.3554		PW =	0.3554	X	$18,962	$6,739
YEAR 40	INTERSTATE							
	PAVEMENT PATCH CLASS B	0.50%	27	SQ YD	$150.00		$4,050	
	LONGITUDINAL SHLD JT R&S	100.00%	4,000	LIN FT	$2.00		$8,000	
	CENTERLINE JT R&S	100.00%	2,000	LIN FT	$2.00		$4,000	
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	1,930	LIN FT	$2.00		$3,860	
	RANDOM CRACK R&S	50.00%	2,000	LIN FT	$2.00		$4,000	
	PD PVMT PATCH M&F HMA SURF 1.50"	0.50%	27	SQ YD	$77.98		$2,105	
	PWFn =	0.3066		PW =	0.3066	X	$26,015	$7,975
								$130,146
	ROUTINE MAINTENANCE ACTIVITY		0.76	Lane Miles	$0.00		$0	$0
							MAINTENANCE LIFE-CYCLE COST	$130,146
45	YEAR LIFE CYCLE	CRFn = 0.0407852					MAINTENANCE ANNUAL COST PER MILE	$28,026



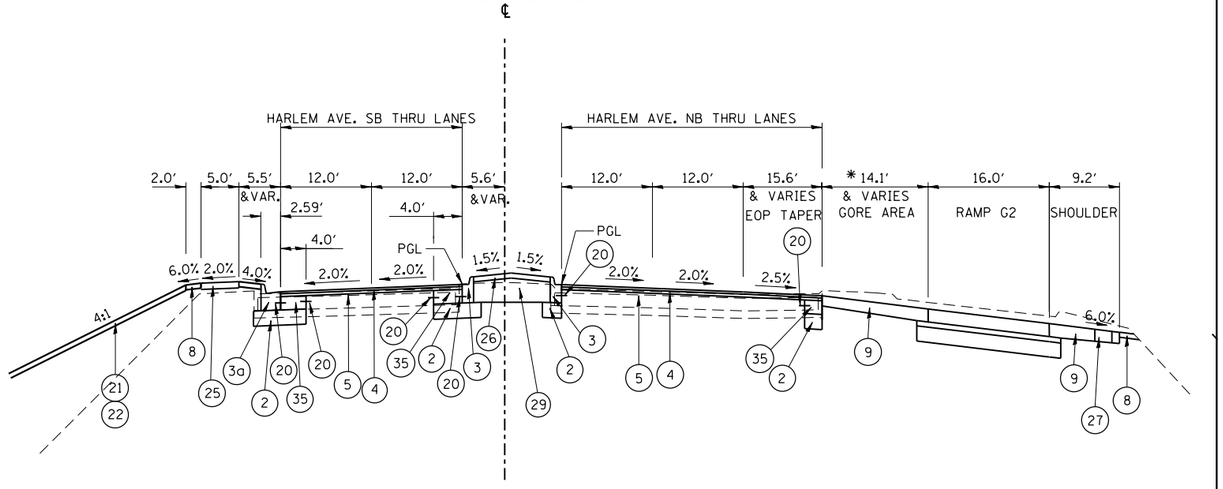
HARLEM AVE
EXISTING SECTION
STA. 307+05.74 TO STA. 309+74.84



HARLEM AVE
EXISTING SECTION
STA. 312+68.13 TO STA. 315+32.10



HARLEM AVE
PROPOSED TANGENT SECTION
STA. 307+05.74 TO STA. 309+74.84



HARLEM AVE
PROPOSED TANGENT SECTION
STA. 312+68.13 TO STA. 315+32.10

NOTE:

1. SEE SHEET CR07 THRU CR09 FOR PAVEMENT WIDENING LOCATION AND WIDTH.
2. SEE CR07 AND CR08 FOR STEEL PLATE BEAM GUARDRAIL LOCATION.
3. SEE CR07 THRU CR09 FOR HARLEM AVE. AND RAMP INTERSECTIONS.
4. NEW CONCRETE COMBINATION CURB AND GUTTER AND PCC PAVEMENT SHALL HAVE LONGITUDINAL TIES WITH EXISTING PCC BASE (WHERE APPLICABLE).
5. BRIDGE OMISSION FROM STA. 309+74.84 TO STA. 312+68.13.

* CROSS SLOPE VARIES AT GORE AREA

** PAVEMENT WIDENING LIMITS END AT STA. 309+80.34.

FILE NAME = D160R49.sht_Typical_Harlem.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/10/2016	DATE -	REVISED -

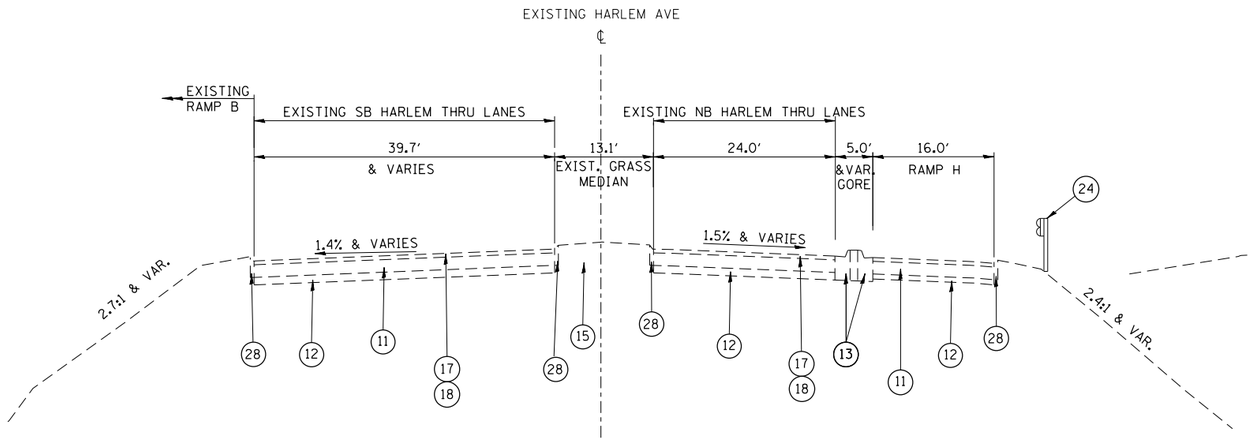
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ILLINOIS ROUTE 43 (HARLEM AVE.)
TYPICAL SECTIONS

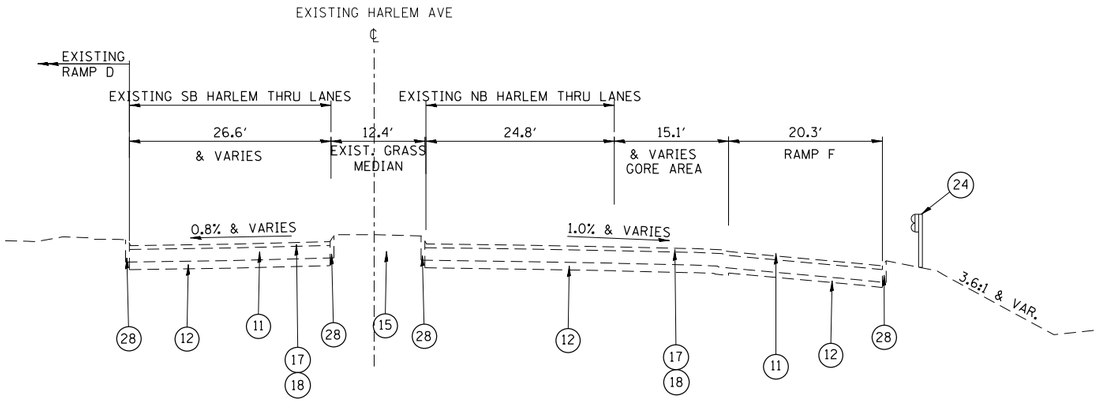
SCALE: NTS | SHEET NO. 4 OF 4 SHEETS | STA.307+05.74 TO STA. 315+32.10

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		1
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

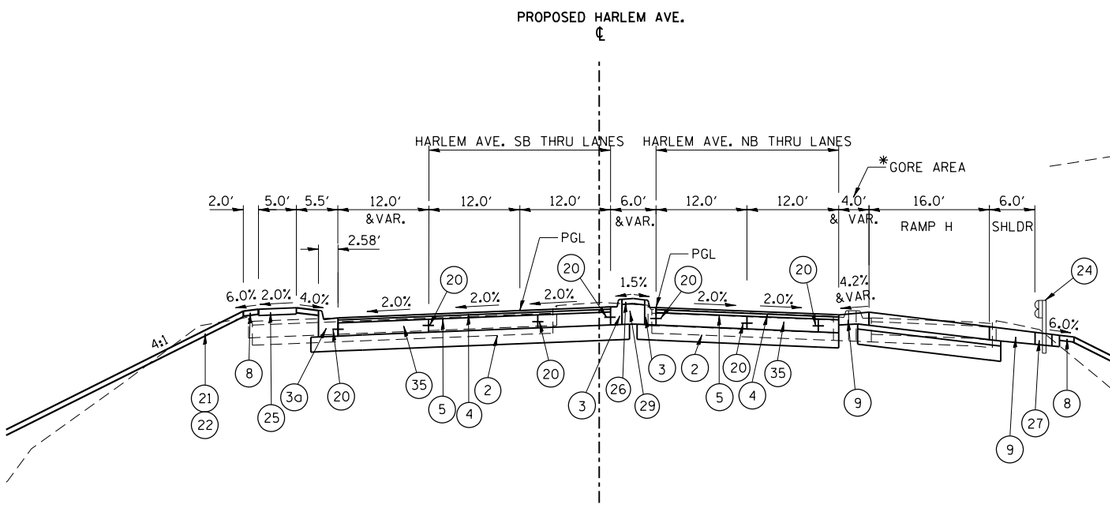
CT3A



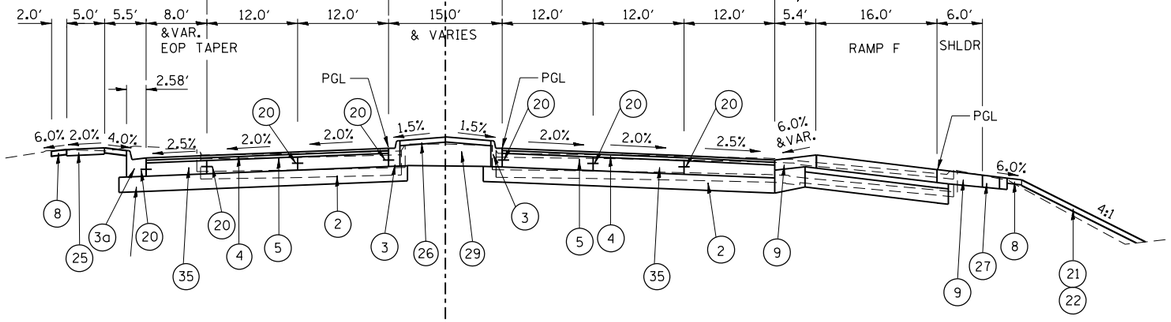
HARLEM AVE
EXISTING SECTION
STA. STA. 315+32.10 TO STA. 317+96.78



HARLEM AVE
EXISTING SECTION
STA. STA. 320+77.06 TO STA. 321+86.34



HARLEM AVE
PROPOSED TANGENT SECTION
STA. STA. 314+30.00 TO STA. 317+96.78



HARLEM AVE
PROPOSED TANGENT SECTION
STA. STA. 320+77.06 TO STA. 321+86.34

NOTE:

1. SEE SHEET CR07 THRU CR09 FOR PAVEMENT WIDENING LOCATION AND WIDTH.
2. SEE CR07 AND CR08 FOR STEEL PLATE BEAM GUARDRAIL LOCATION.
3. SEE CR07 THRU CR09 FOR HARLEM AVE. AND RAMP INTERSECTIONS.
4. NEW CONCRETE COMBINATION CURB AND GUTTER AND PCC PAVEMENT SHALL HAVE LONGITUDINAL TIES WITH EXISTING PCC BASE (WHERE APPLICABLE).
5. BRIDGE OMISSION FROM STA. 317+96.78 TO STA. 320+77.06.

* CROSS SLOPE VARIES AT GORE AREA

FILE NAME = D160R49.sht_Typical_Harlem.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 3/2/2016	DATE -	REVISED -

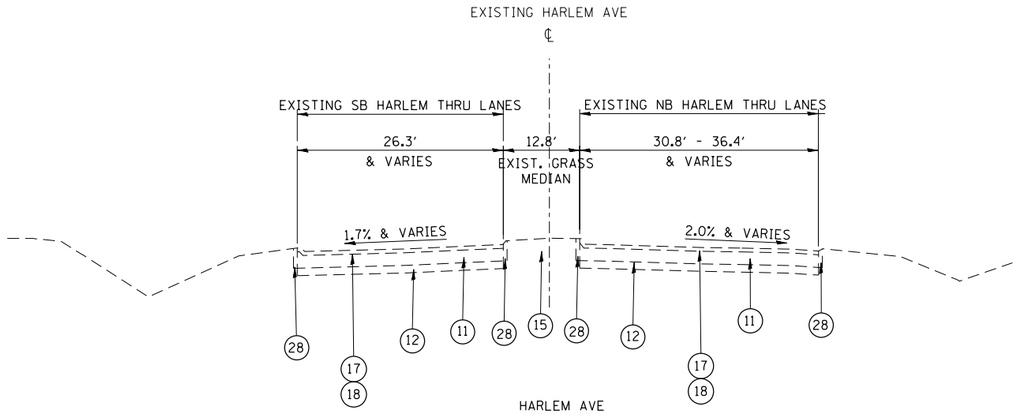
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ILLINOIS ROUTE 43 (HARLEM AVE.)
TYPICAL SECTIONS

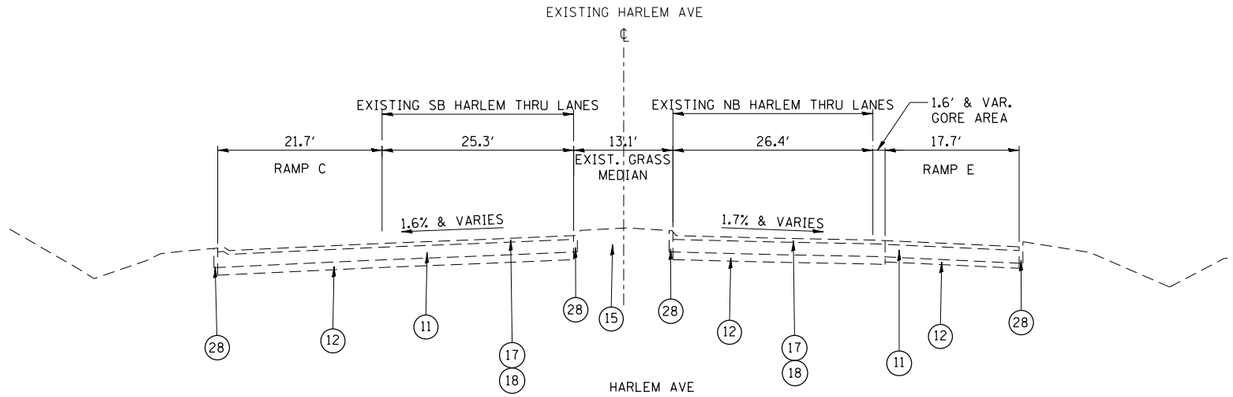
SCALE: NTS | SHEET NO. 4 OF 4 SHEETS | STA.315+32.10 TO STA. 321+86.34

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		2
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

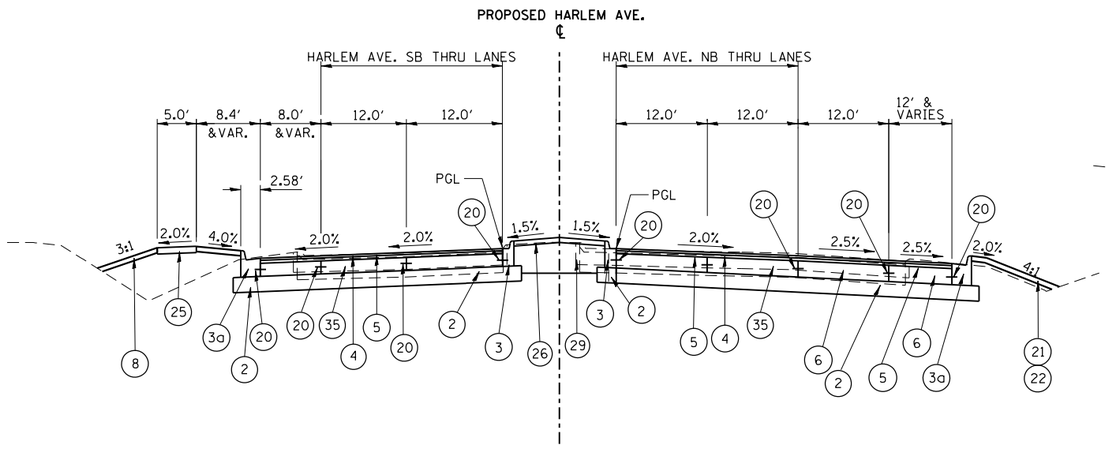
CT3B



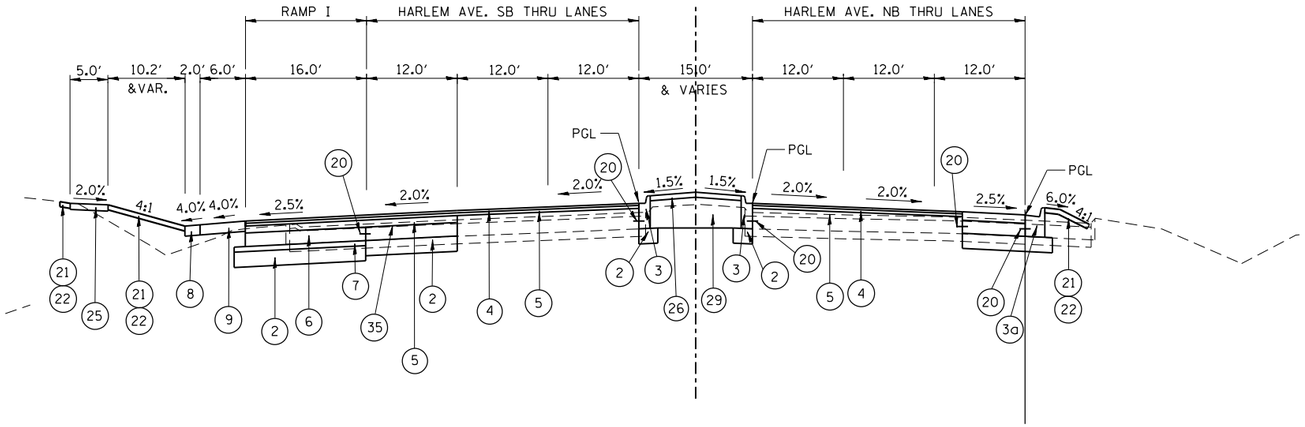
HARLEM AVE
EXISTING SECTION
STA. STA. 321+86.34 TO STA. 323+59.20



HARLEM AVE
EXISTING SECTION
STA. STA. 323+59.20 TO STA. 334+56.83



HARLEM AVE
PROPOSED TANGENT SECTION
STA. STA. 321+86.34 TO STA. 324+70.00



HARLEM AVE
PROPOSED TANGENT SECTION
STA. STA. 324+70.00 TO STA. 334+56.83

NOTE:

1. SEE SHEET CR07 THRU CR09 FOR PAVEMENT WIDENING LOCATION AND WIDTH.
2. SEE CR07 AND CR08 FOR STEEL PLATE BEAM GUARDRAIL LOCATION.
3. SEE CR07 THRU CR09 FOR HARLEM AVE. AND RAMP INTERSECTIONS.
4. NEW CONCRETE COMBINATION CURB AND GUTTER AND PCC PAVEMENT SHALL HAVE LONGITUDINAL TIES WITH EXISTING PCC BASE (WHERE APPLICABLE).

FILE NAME = D160R49_sht_Typical_Harlem.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 3/2/2016	DATE -	REVISED -

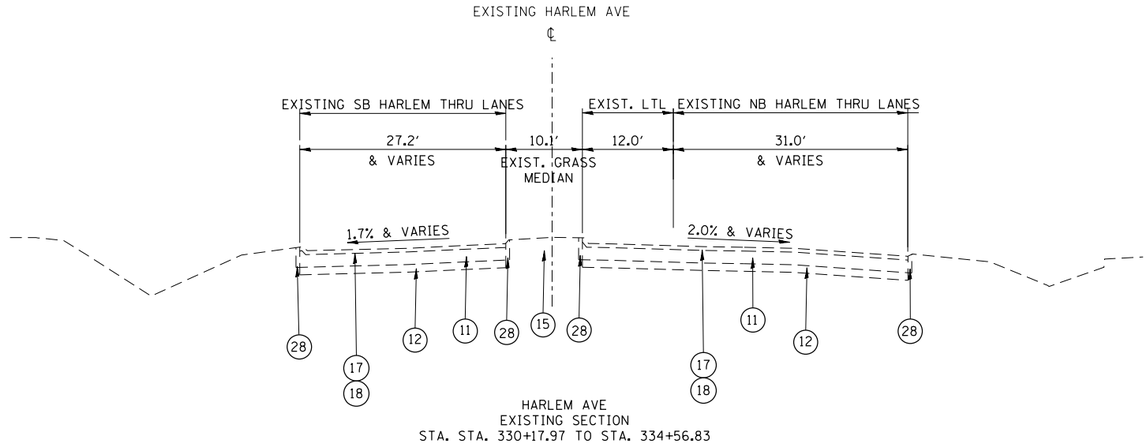
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ILLINOIS ROUTE 43 (HARLEM AVE.)
TYPICAL SECTIONS

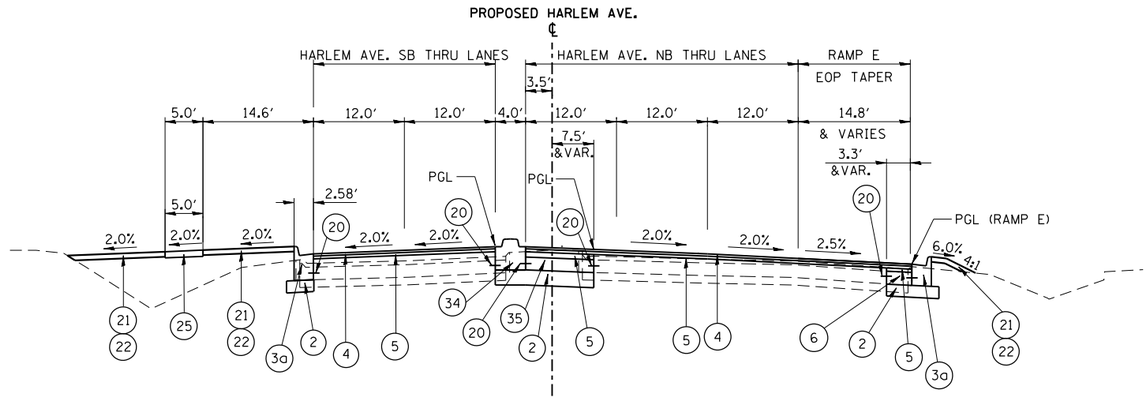
SCALE: NTS | SHEET NO. 3 OF 4 SHEETS | STA.321+86.34 TO STA. 330+17.97

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		3
		CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT		

CT3C



HARLEM AVE
EXISTING SECTION
STA. STA. 330+17.97 TO STA. 334+56.83



HARLEM AVE
PROPOSED TANGENT SECTION
STA. STA. 330+17.97 TO STA. 334+56.83

FILE NAME = D160R49_sht_Typical_Harlem.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ′ / in.	CHECKED -	REVISED -
	PLOT DATE = 2/10/2016	DATE -	REVISED -

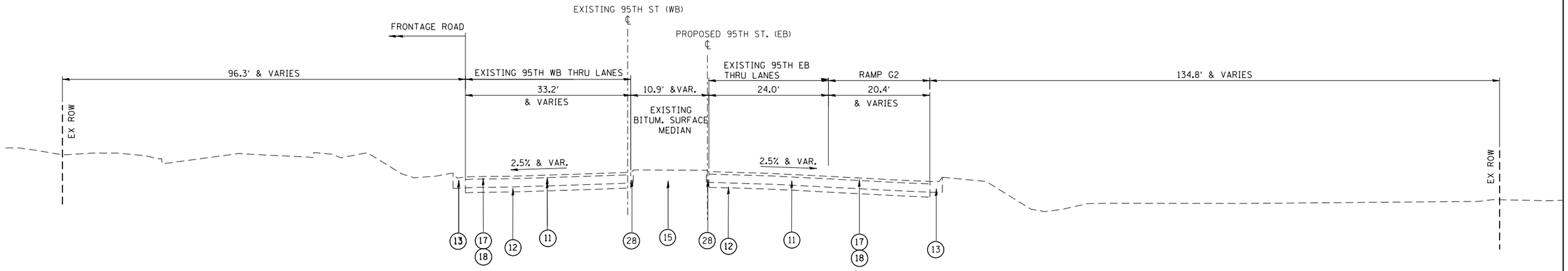
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ILLINOIS ROUTE 43 (HARLEM AVE.)
TYPICAL SECTIONS

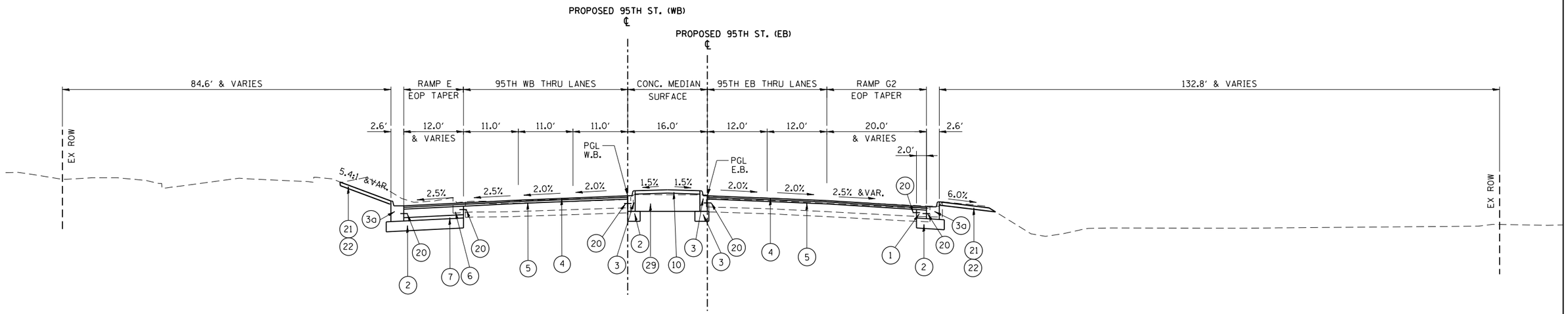
SCALE: NTS | SHEET NO. 4 OF 4 SHEETS | STA.330+17.97 | TO STA. 334+56.83

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		4
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

CT3D



95TH STREET
EXISTING TYPICAL SECTION
STA. STA. 627+01.49 TO STA. 636+14.88



95TH STREET
PROPOSED TYPICAL SECTION
STA. STA. 627+01.49 TO STA. 636+14.88

NOTES:

1. SEE CR06 FOR 95TH STREET AND RAMP INTERSECTION.
2. TOP OF NEW PCC PAVEMENT AND PCC BASE FOR WIDENING AND RAMPS SHALL MATCH TOP OF EXISTING PCC BASE.
3. NEW CONCRETE COMBINATION CURB AND GUTTER AND PCC PAVEMENT SHALL HAVE LONGITUDINAL TIES WITH EXISTING PCC BASE.

FILE NAME = D160R49_sht_Typical_95th.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/10/2016	DATE -	REVISED -

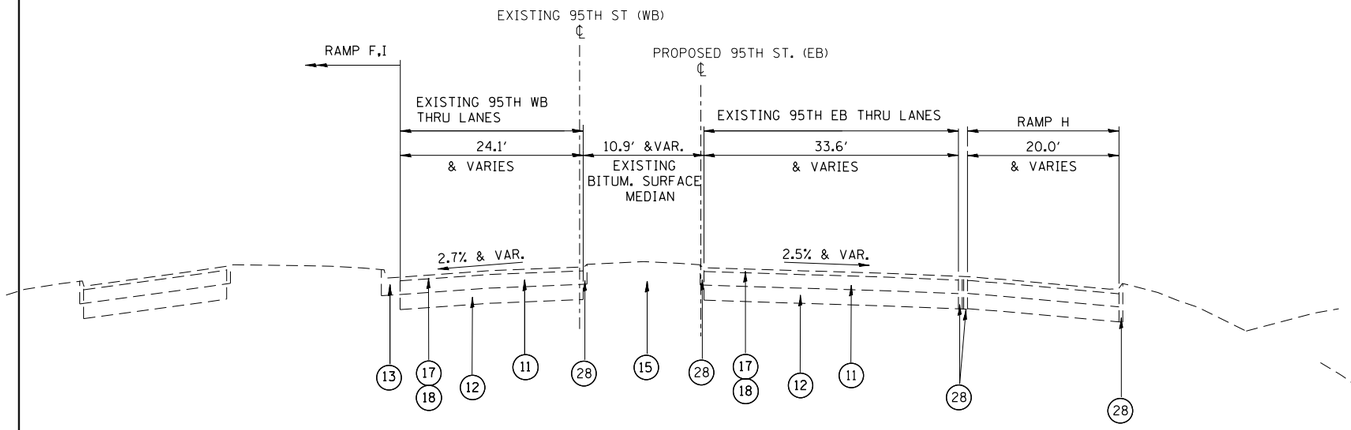
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

US ROUTE 12 & 20 (95TH STREET)
TYPICAL SECTION

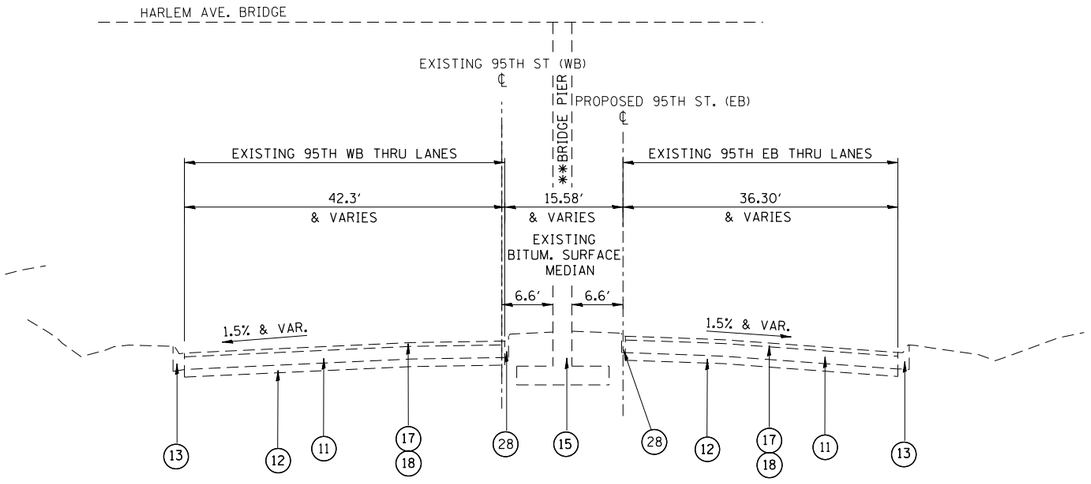
SCALE: NTS | SHEET NO. 6 OF 6 SHEETS | STA.627+01.49 | TO STA. 636+14.88

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		5
		CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT		

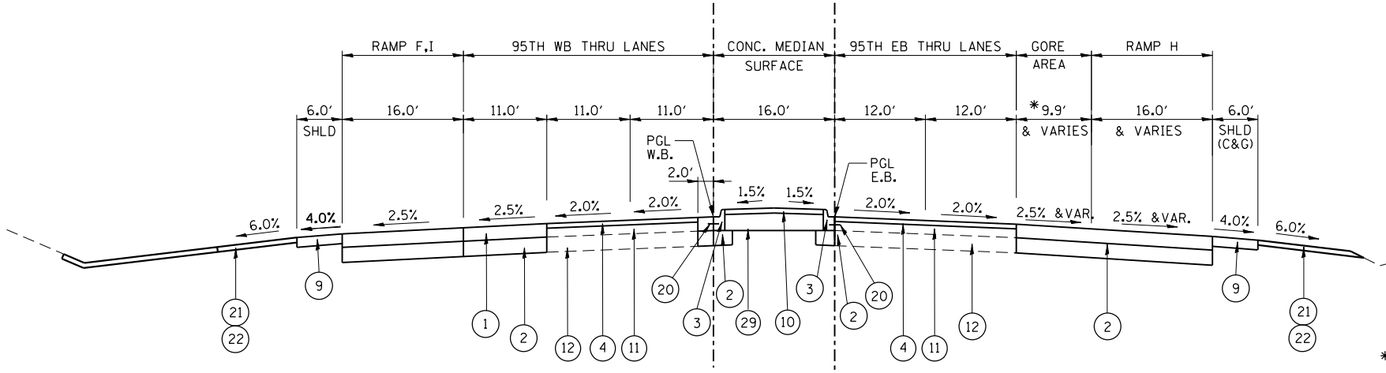
CT2F



95TH STREET
EXISTING TYPICAL SECTION
STA. 615+96.81 TO STA. 618+23.65
STA. 622+92.15 TO STA. 623+93.24



95TH STREET
EXISTING TYPICAL SECTION
STA. STA. 618+23.65 TO STA. 622+92.15
STA. 623+93.24 TO STA. 627+01.49



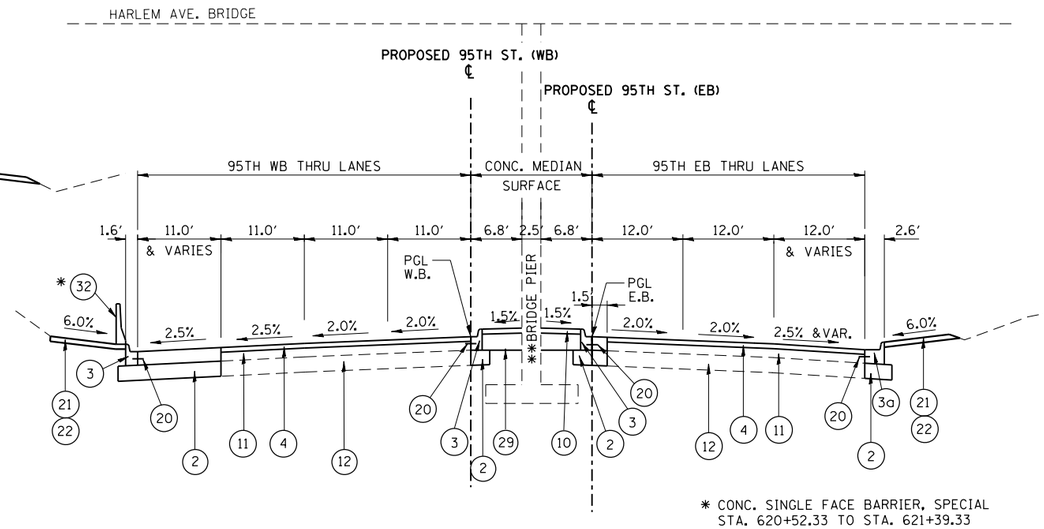
95TH STREET
PROPOSED TYPICAL SECTION
STA. 615+96.81 TO STA. 618+23.65
STA. 622+92.15 TO STA. 623+93.24

* CROSS SLOPE VARIES AT GORE AREA

PROPOSED SUPERELEVATED SECTION

FULL SUPERELEVATION RATE
S.E. TRANSITION (IN) = STA. 614+76 TO STA. 617+41
FULL S.E. = STA. 617+41 TO STA. 619+41
S.E. TRANSITION (OUT) = STA. 619+41 TO STA. 622+06

SEE ROADWAY PLANS FOR SUPERELEVATION DETAILS.



* CONC. SINGLE FACE BARRIER, SPECIAL STA. 620+52.33 TO STA. 621+39.33

** HARLEM AVE. BRIDGE PIER FROM STA. 11+62 TO STA. 12+81

95TH STREET
PROPOSED TYPICAL SECTION
STA. STA. 618+23.65 TO STA. 622+92.15
STA. 623+93.24 TO STA. 627+01.49

NOTES:

1. SEE CR04 AND CR05 FOR STEEL PLATE BEAM GUARDRAIL LOCATIONS.
2. SEE CR04 AND CR05 FOR HARLEM AVE. AND RAMP I, F AND H INTERSECTIONS.
3. TOP OF NEW PCC PAVEMENT AND PCC BASE FOR WIDENING AND RAMPS SHALL MATCH TOP OF EXISTING PCC BASE.
4. NEW CONCRETE COMBINATION CURB AND GUTTER AND PCC PAVEMENT SHALL HAVE LONGITUDINAL TIES WITH EXISTING PCC BASE.

FILE NAME = D160R49_sht_Typical_95th.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/10/2016	DATE -	REVISED -

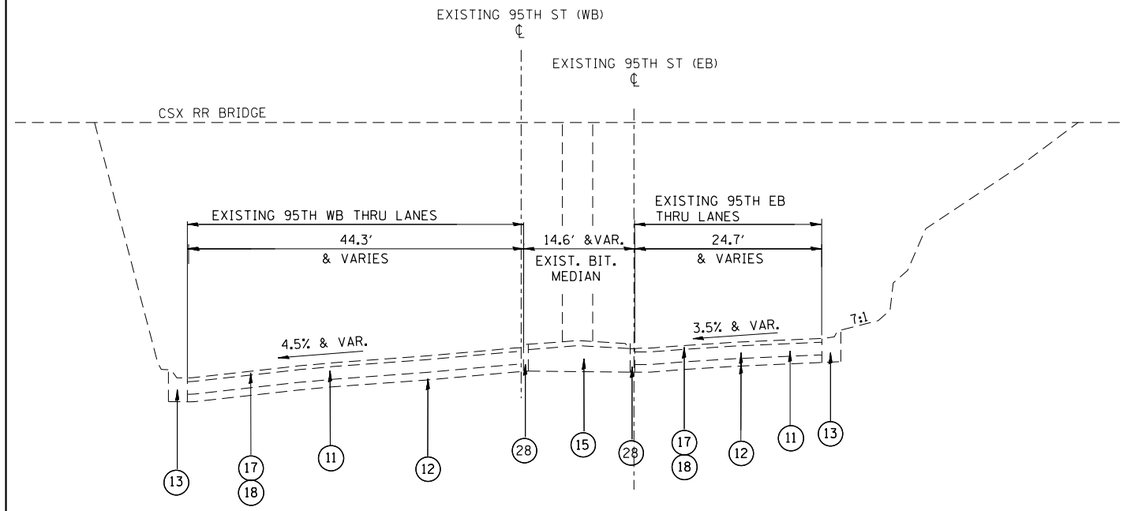
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

US ROUTE 12 & 20 (95TH STREET)
TYPICAL SECTION

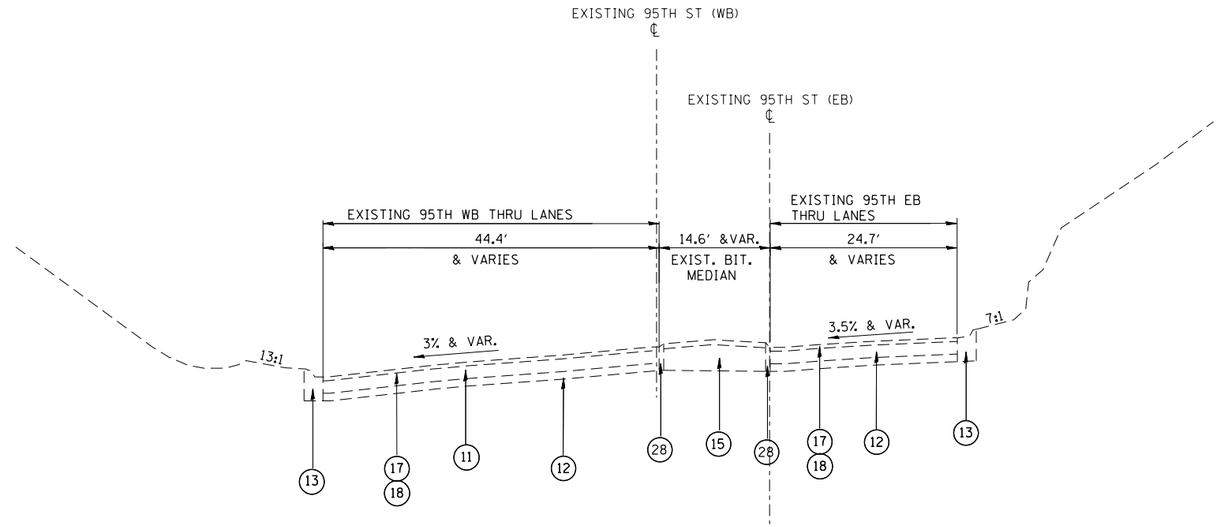
SCALE: NTS | SHEET NO. 5 OF 6 SHEETS | STA.615+96.81 TO STA. 627+01.49

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		6
		CONTRACT NO.		
		ILLINOIS	FED. AID PROJECT	

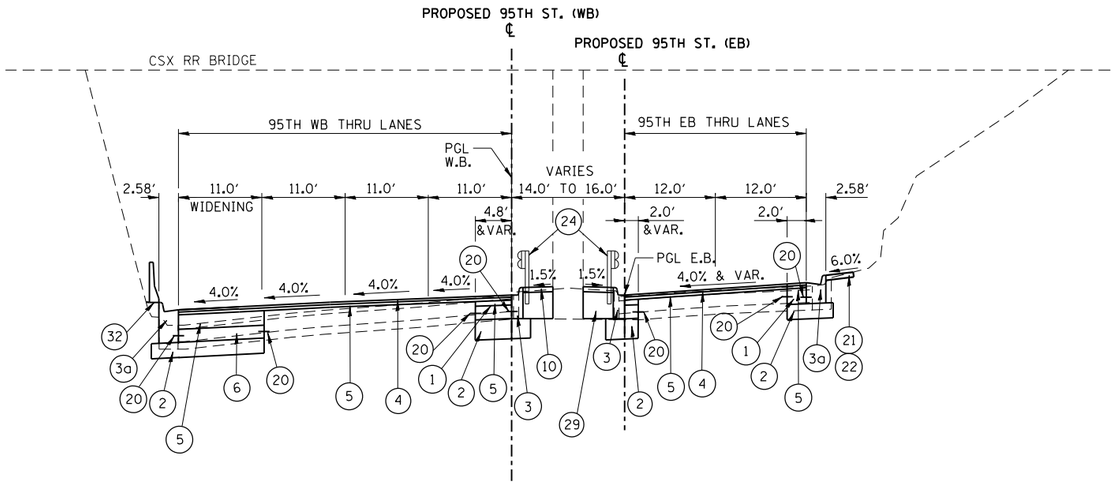
CT2E



95TH STREET (WB)
EXISTING TYPICAL SECTION
STA. 610+44.91 TO STA. 612+25.89



95TH STREET (WB)
EXISTING TYPICAL SECTION
STA. 612+25.89 TO STA. 615+96.81

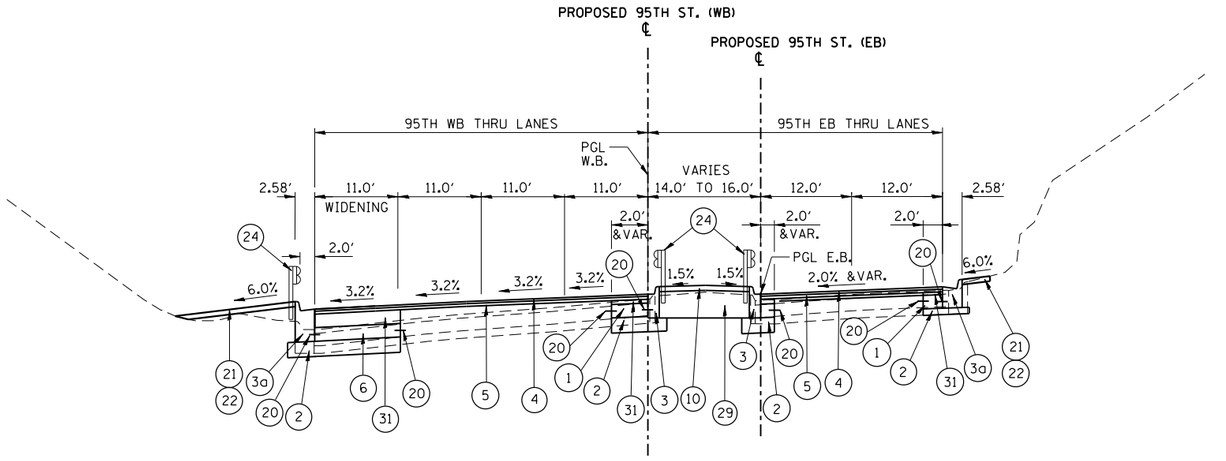


95TH STREET (WB)
PROPOSED TYPICAL SECTION
STA. 610+44.91 TO STA. 612+25.89

PROPOSED SUPERELEVATED SECTION

FULL SUPERELEVATION RATE
S.E. TRANSITION (IN) = STA. 609+77 TO STA. 610+74
FULL S.E. = STA. 610+74 TO STA. 611+66
S.E. TRANSITION = STA. 611+66 TO STA. 612+06

SEE ROADWAY PLANS FOR SUPERELEVATION DETAILS.



95TH STREET (WB)
PROPOSED TYPICAL SECTION
STA. 612+25.89 TO STA. 615+96.81

PROPOSED SUPERELEVATED SECTION

FULL SUPERELEVATION RATE
S.E. TRANSITION = STA. 611+66 TO STA. 612+06
FULL S.E. = STA. 612+06 TO STA. 612+98
S.E. TRANSITION (OUT) = STA. 612+98 TO STA. 613+56

SEE ROADWAY PLANS FOR SUPERELEVATION DETAILS.

NOTES:

1. SEE CR021 AND CR03 FOR STEEL PLATE BEAM GUARDRAIL LOCATIONS.
2. TOP OF NEW PCC PAVEMENT AND PCC BASE FOR WIDENING AND RAMPS SHALL MATCH TOP OF EXISTING PCC BASE.
3. NEW CONCRETE COMBINATION CURB AND GUTTER AND PCC PAVEMENT SHALL HAVE LONGITUDINAL TIES WITH EXISTING PCC BASE.

FILE NAME = D160R49_sht_Typical_95th.DGN	USER NAME = GROodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/10/2016	DATE -	REVISED -

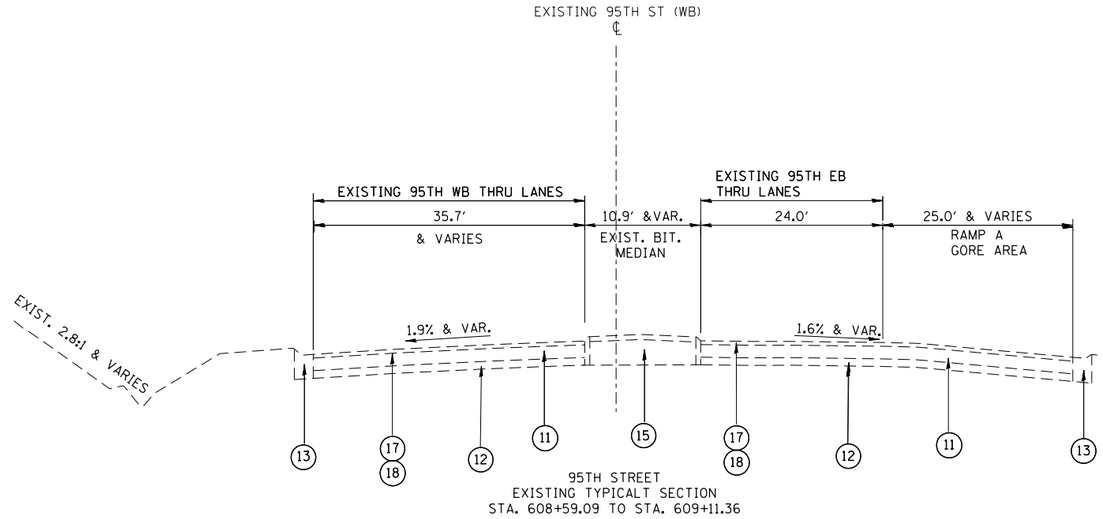
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

US ROUTE 12 & 20 (95TH STREET)
TYPICAL SECTION

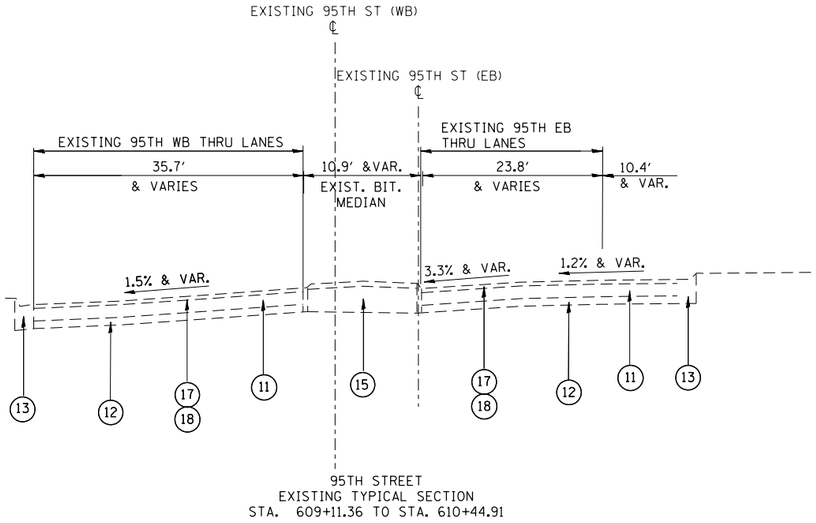
SCALE: NTS | SHEET NO. 4 OF 6 SHEETS | STA.610+44.91 | TO STA. 615+96.81

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		7
		CONTRACT NO.		
		ILLINOIS	FED. AID PROJECT	

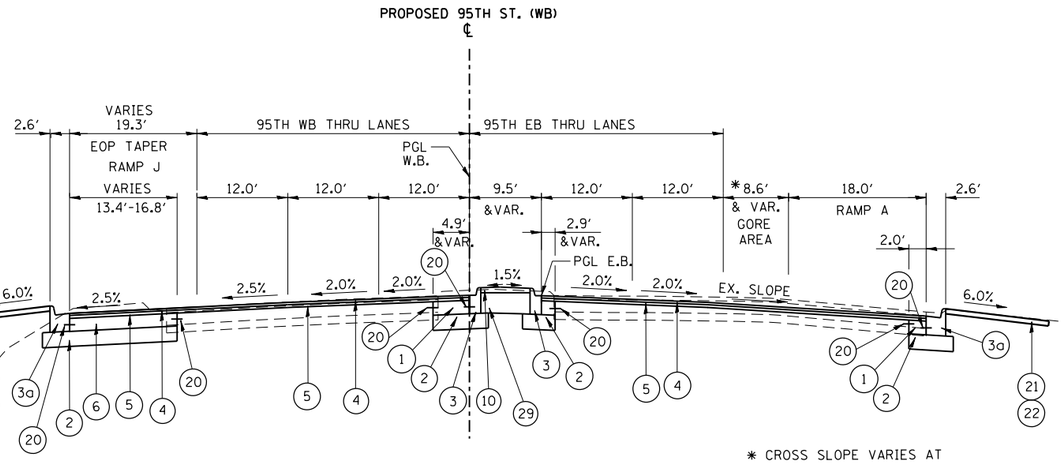
CT2D



95TH STREET
EXISTING TYPICALT SECTION
STA. 608+59.09 TO STA. 609+11.36



95TH STREET
EXISTING TYPICAL SECTION
STA. 609+11.36 TO STA. 610+44.91

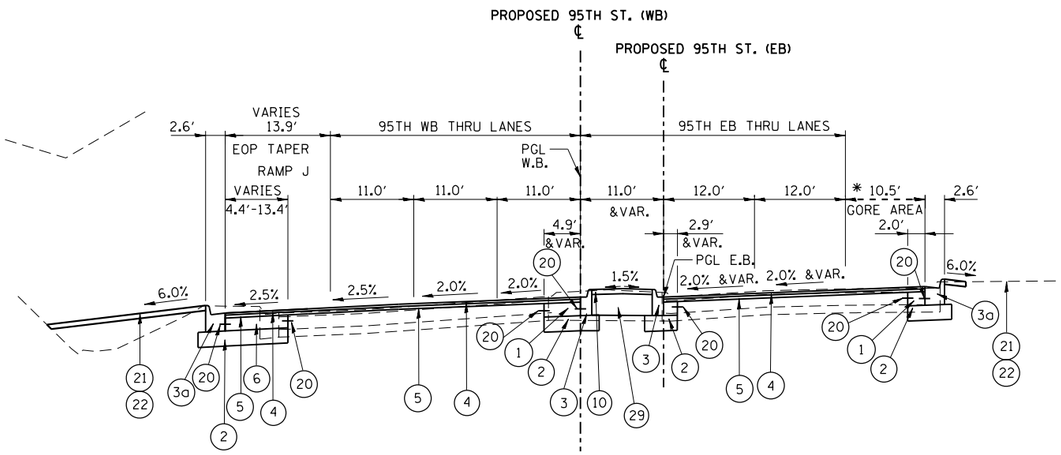


* CROSS SLOPE VARIES AT
GORE AREA

95TH STREET
PROPOSED TYPICAL SECTION
STA. 608+59.09 TO STA. 609+11.36

NOTES:

1. SEE CR02 FOR 95TH STREET AND RAMP A INTERSECTION.
2. TOP OF NEW PCC PAVEMENT AND PCC BASE FOR WIDENING AND RAMPS SHALL MATCH TOP OF EXISTING PCC BASE.
3. NEW CONCRETE COMBINATION CURB AND GUTTER AND PCC PAVEMENT SHALL HAVE LONGITUDINAL TIES WITH EXISTING PCC BASE.



95TH STREET (WB)
PROPOSED TYPICAL SECTION
STA. 609+11.36 TO STA. 610+44.91

PROPOSED SUPERELEVATED SECTION

FULL SUPERELEVATION RATE
S.E. TRANSITION (IN) = STA. 609+77 TO STA. 610+74
FULL S.E. = STA. 610+74 TO STA. 611+66
S.E. TRANSITION = STA. 611+66 TO STA. 612+06

SEE ROADWAY PLANS FOR SUPERELEVATION DETAILS.

FILE NAME = D160R49_sht_Typical_95th.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/10/2016	DATE -	REVISED -

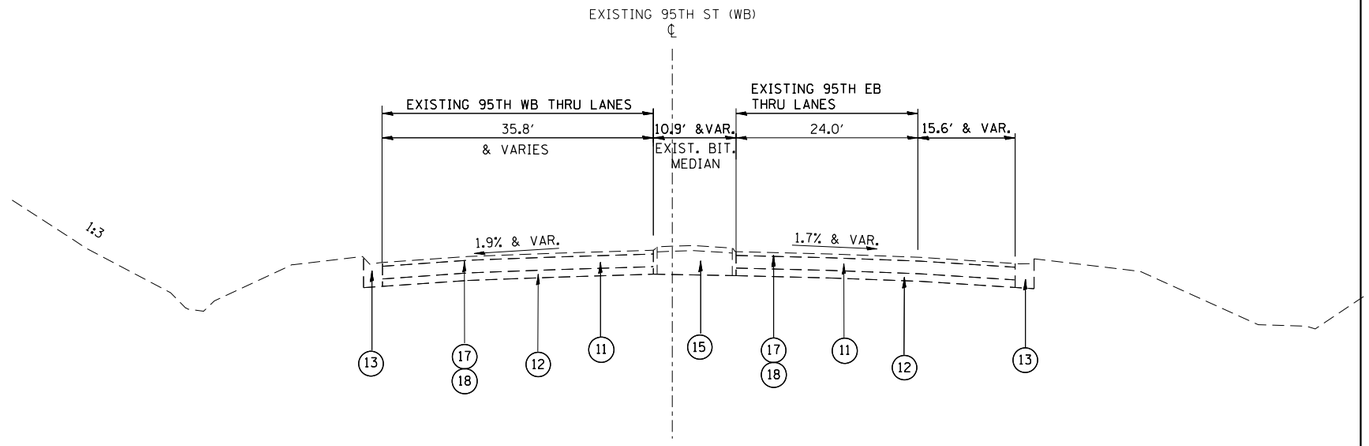
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

US ROUTE 12 & 20 (95TH STREET)
TYPICAL SECTION

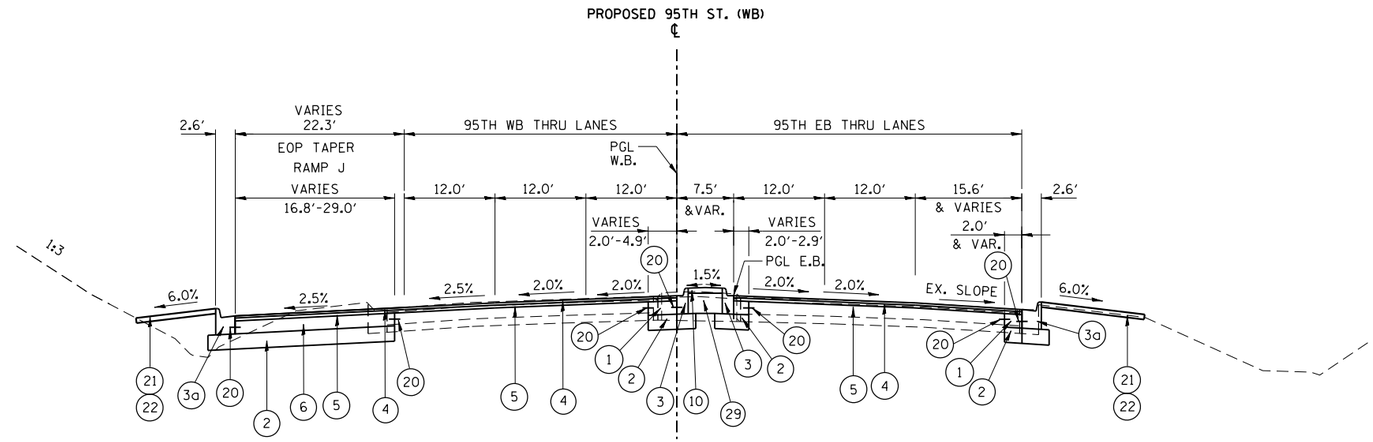
SCALE: NTS | SHEET NO. 3 OF 6 SHEETS | STA.608+59.09 TO STA. 610+44.91

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		8
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

CT2C



95TH STREET
EXISTING TYPICAL SECTION
STA. 606+46.27 TO STA. 608+59.09



95TH STREET
PROPOSED TYPICAL SECTION
STA. 606+46.27 TO STA. 608+59.09

NOTES:

1. SEE CR02 FOR 95TH STREET AND RAMP A INTERSECTION.
2. TOP OF NEW PCC PAVEMENT AND PCC BASE FOR WIDENING AND RAMPS SHALL MATCH TOP OF EXISTING PCC BASE.
3. NEW CONCRETE COMBINATION CURB AND GUTTER AND PCC PAVEMENT SHALL HAVE LONGITUDINAL TIES WITH EXISTING PCC BASE.

FILE NAME = D160R49_sht_Typical_95th.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/10/2016	DATE -	REVISED -

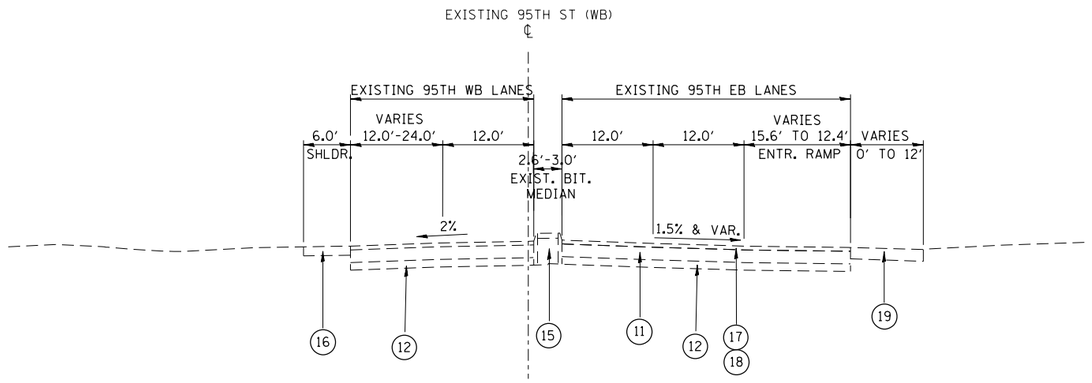
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

US ROUTE 12 & 20 (95TH STREET)
TYPICAL SECTION

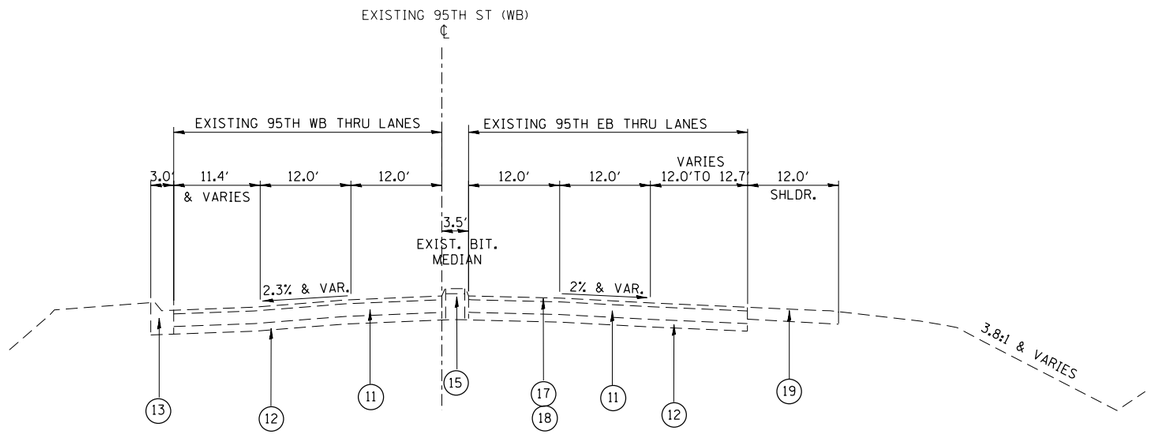
SCALE: NTS | SHEET NO. 2 OF 6 SHEETS | STA.605+41.04 TO STA. 608+59.09

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		9
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

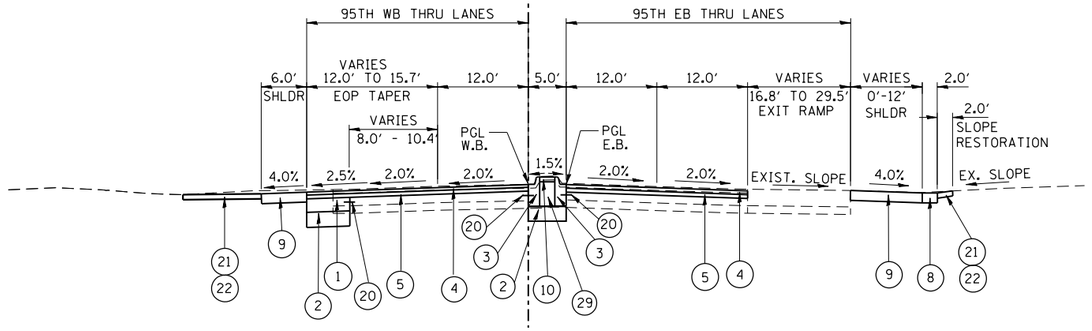
CT2B



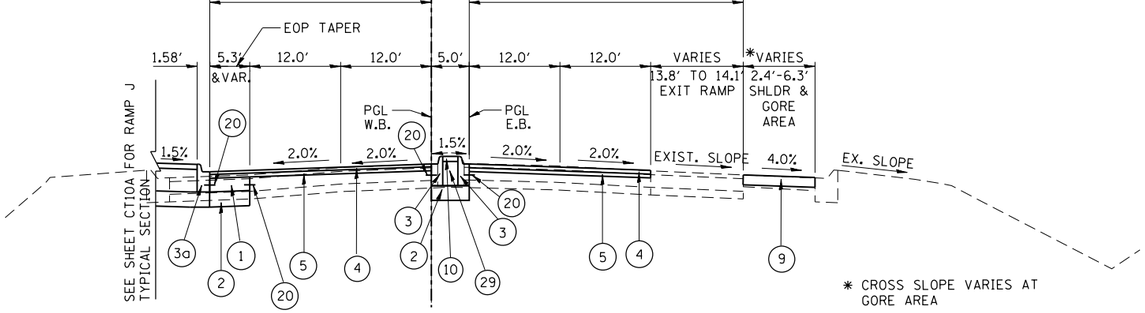
95TH STREET
EXISTING TYPICAL SECTION
STA. 600+00 TO STA. 603+16.01



95TH STREET
EXISTING TYPICAL SECTION
STA. 603+16.01 TO STA. 605+41.04



95TH STREET
PROPOSED TYPICAL SECTION
STA. 600+00 TO STA. 603+16.01



95TH STREET
PROPOSED TYPICAL SECTION
STA. 603+16.01 TO STA. 605+41.04

NOTES:

1. SEE CR01 FOR 95TH STREET AND RAMP TO NB I-294 NTERSECTION.
2. TOP OF NEW PCC BASE FOR WIDENING SHALL MATCH TOP OF EXISTING PCC BASE.
3. NEW CONCRETE COMBINATION CURB AND GUTTER AND PCC PAVEMENT SHALL HAVE LONGITUDINAL TIES WITH EXISTING PCC BASE.

FILE NAME = D160R49_sht_Typical_95th.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/10/2016	DATE -	REVISED -

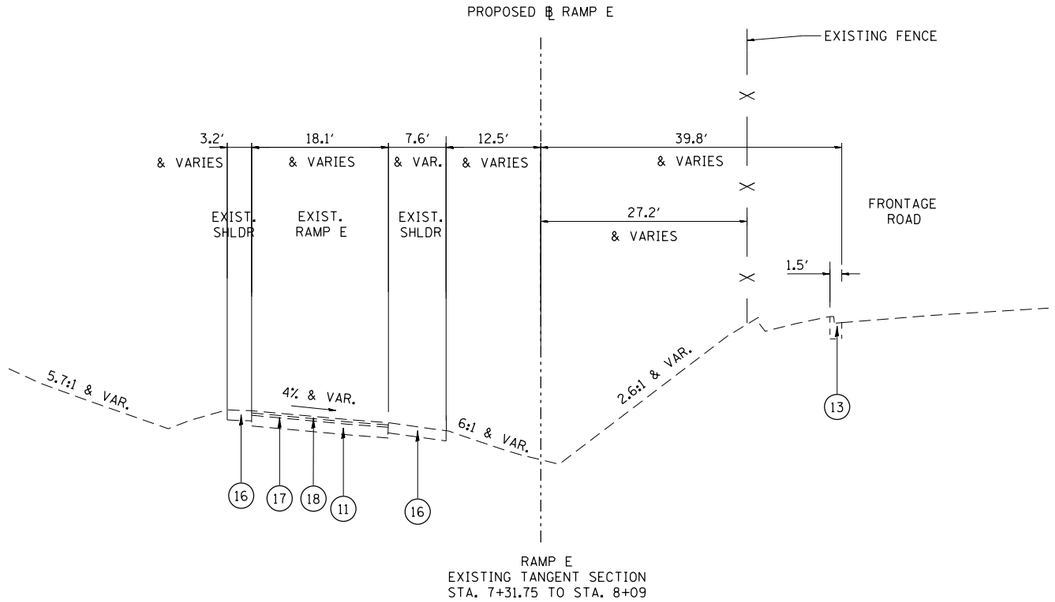
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

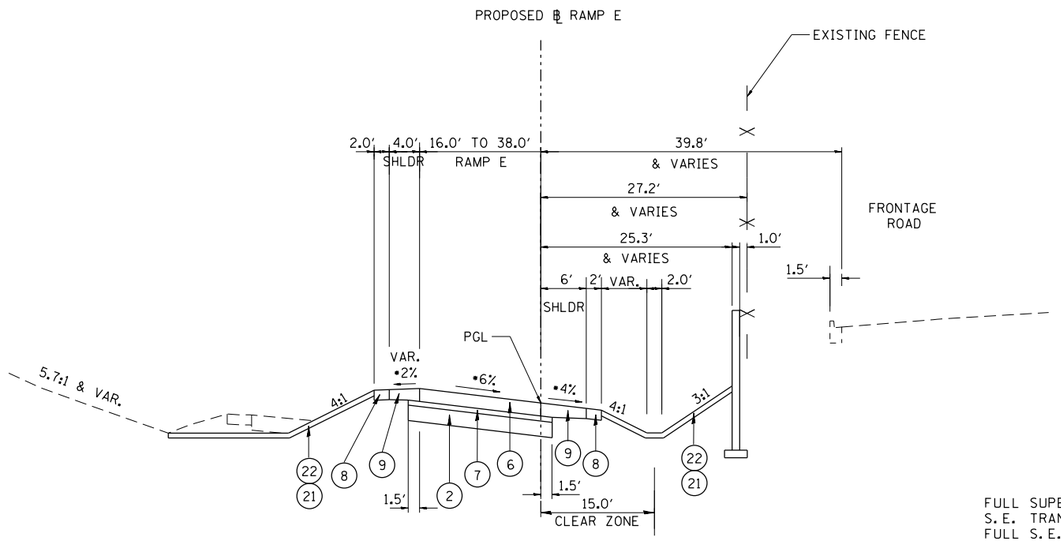
US ROUTE 12 & 20 (95TH STREET)
TYPICAL SECTION

SCALE: NTS | SHEET NO. 1 OF 6 SHEETS | STA.600+00 TO STA. 605+41.04

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		10
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

CT2A





•CROSS SLOPE VARIES WITHIN SUPERELEVATION TRANSITION

RAMP E
PROPOSED TANGENT SECTION
STA. 7+31.75 TO STA. 8+09

FULL SUPERELEVATION RATE
S.E. TRANSITION (IN) = STA. 3+92.23 TO STA. 4+55.23
FULL S.E. = STA. 4+55.23 TO STA. 6+94.05
S.E. TRANSITION = STA. 6+94.05 TO STA. 9+24.02

SEE ROADWAY PLANS FOR SUPERELEVATION DETAILS.

FILE NAME = D160R49_sht_Typical_Ramp_E.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/20/2016	DATE -	REVISED -

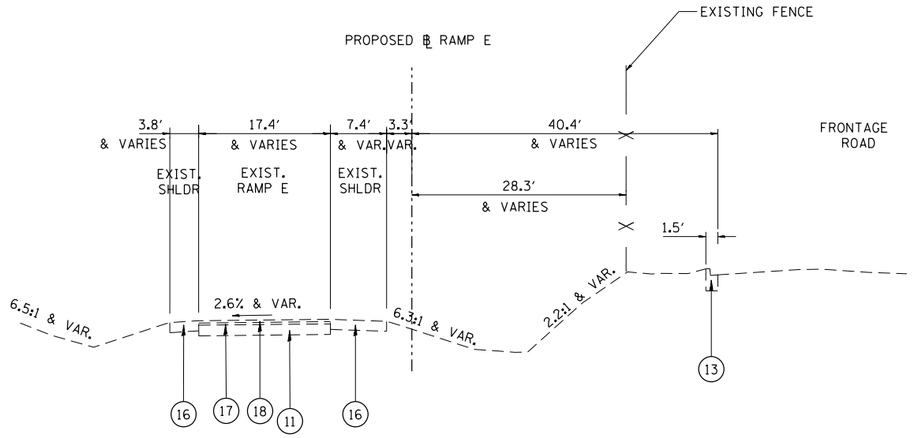
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

RAMP E
TYPICAL SECTIONS

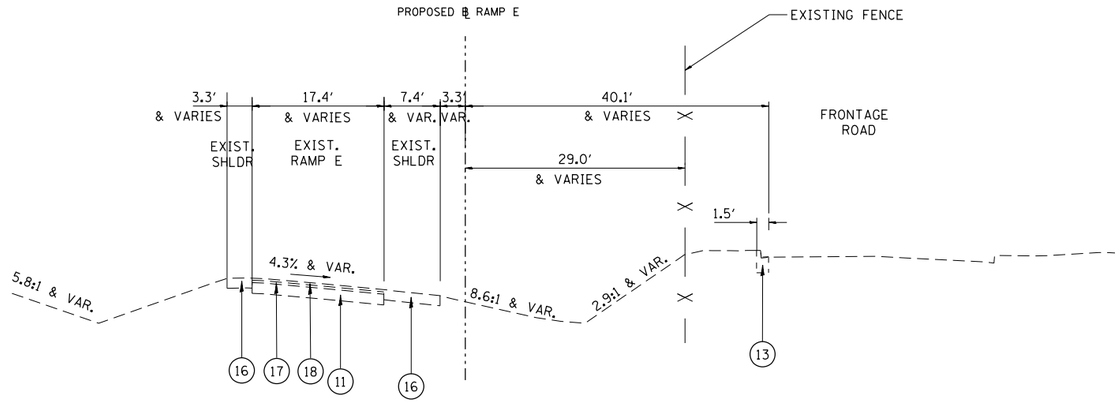
SCALE: N/A | SHEET NO. 1 OF 3 SHEETS | STA.6+00 TO STA. 8+09.05

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		11
		CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT		

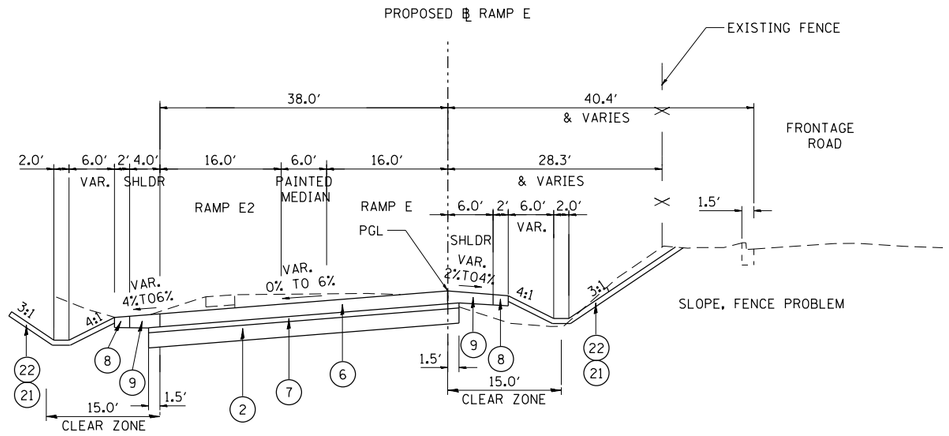
CT4A



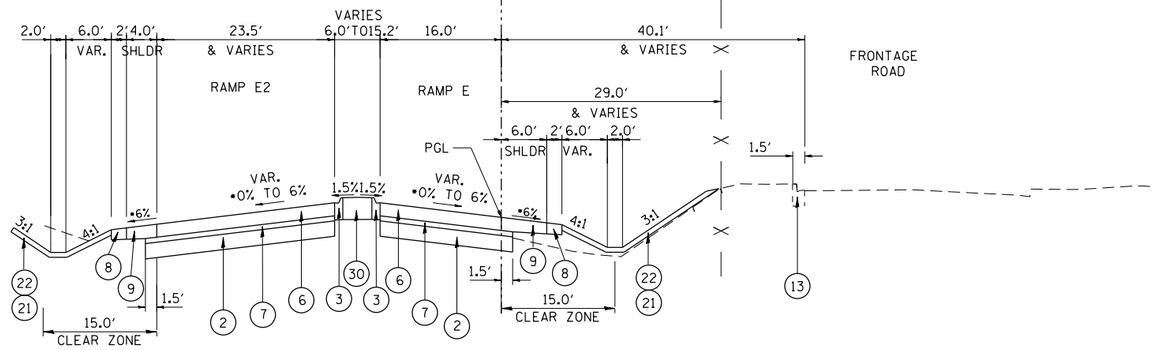
RAMP E
EXISTING TANGENT SECTION
STA. 10+81.97 TO STA. 11+61.98



RAMP E
EXISTING SUPERELEVATED SECTION
STA. 11+61.98 TO STA. 12+80.06



RAMP E
PROPOSED TANGENT SECTION
STA. 10+81.97 TO STA. 11+61.98



•CROSS SLOPE VARIES WITHIN SUPERELEVATION TRANSITION

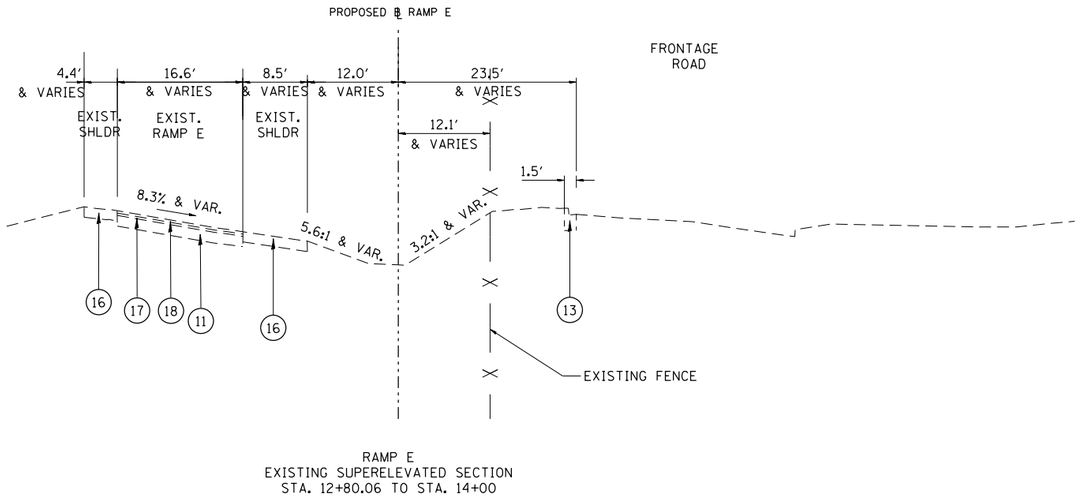
RAMP E
PROPOSED SUPERELEVATED SECTION
STA. 11+61.98 TO STA. 12+80.06

NOTES:

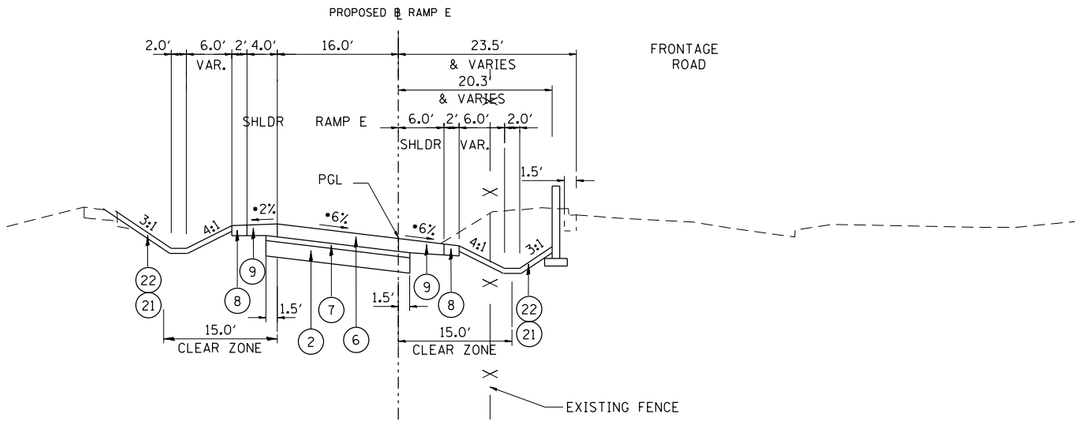
1. FULL SUPERELEVATION FROM STA. 4+55.23 TO STA. 6+94.05 AND FROM STA. 9+24.02 TO STA. 10+43.57. TRANSITION FROM STA. 3+92.23 TO STA. 4+55.23 AND FROM STA. 6+94.05 TO STA. 9+24.02 AND FROM STA. 10+43.57 TO STA. 11+58.57.
2. SEE ROADWAY PLANS FOR FULL SUPERELEVATION AND SUPERELEVATION DETAILS.

FILE NAME = D160R49_sht_Typical_Ramp_E.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**	**RAMP E TYPICAL SECTIONS**		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN -	REVISED -						COOK		12
	PLOT SCALE = 20.0000 ′ / in.	CHECKED -	REVISED -						CONTRACT NO.		
	PLOT DATE = 2/10/2016	DATE -	REVISED -		SCALE: N/A	SHEET NO. 2 OF 3 SHEETS STA.8+09.05 TO STA. 11+61.98			ILLINOIS FED. AID PROJECT		

CT4B



RAMP E
EXISTING SUPERELEVATED SECTION
STA. 12+80.06 TO STA. 14+00



•CROSS SLOPE VARIES WITHIN SUPERELEVATION TRANSITION

RAMP E
PROPOSED SUPERELEVATED SECTION
STA. 12+80.06 TO STA. 14+00

NOTES:

1. FULL SUPERELEVATION FROM STA. 4+55.23 TO STA. 6+94.05 AND FROM STA. 9+24.02 TO STA. 10+43.57.
   TRANSITION FROM STA. 3+92.23 TO STA. 4+55.23 AND FROM STA. 6+94.05 TO STA. 9+24.02 AND FROM STA. 10+43.57 TO STA. 11+58.57.
2. SEE ROADWAY PLANS FOR FULL SUPERELEVATION AND SUPERELEVATION DETAILS.

FILE NAME = D160R49_sht_Typical_Ramp_E.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/10/2016	DATE -	REVISED -

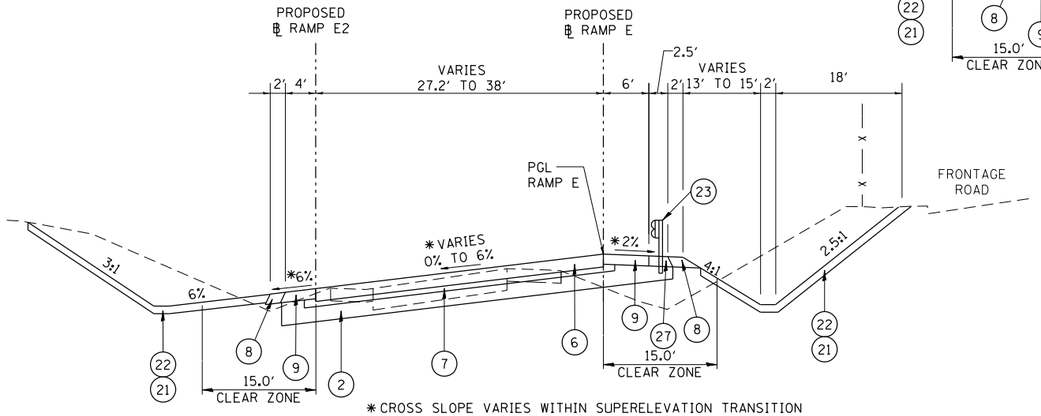
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

RAMP E
TYPICAL SECTIONS

SCALE: N/A | SHEET NO. 3 OF 3 SHEETS | STA.11+61.98 TO STA. 14+00

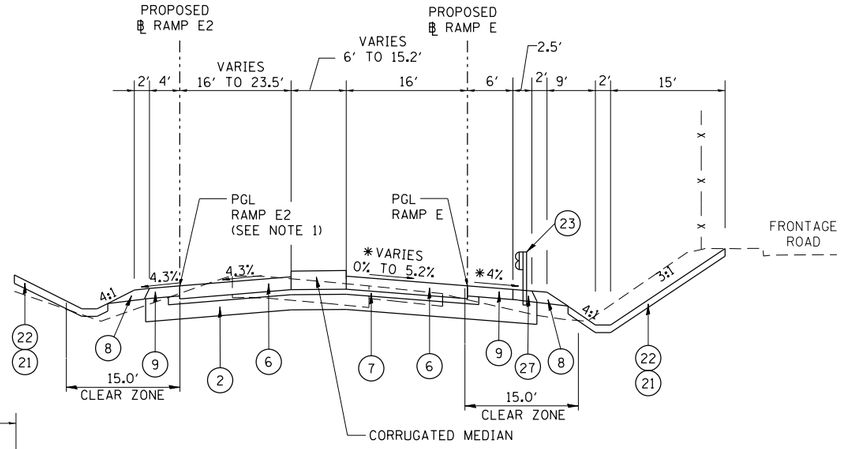
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		13
		CONTRACT NO.		
		ILLINOIS	FED. AID PROJECT	

CT4C



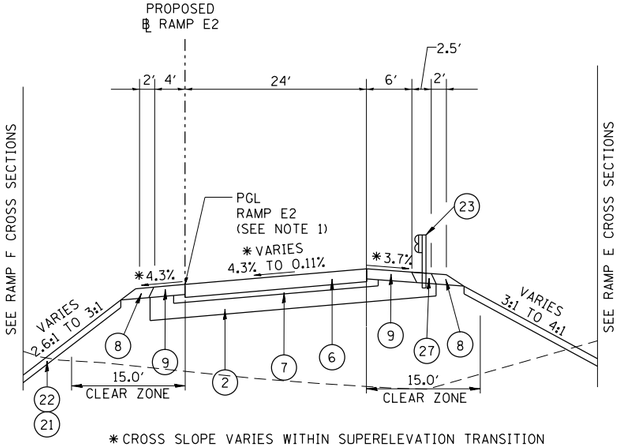
✱CROSS SLOPE VARIES WITHIN SUPERELEVATION TRANSITION

RAMP E / E2
PROPOSED SUPERELEVATED SECTION
STA. 8+09 TO STA. 10+57 /
STA. 21+14 TO STA. 23+39



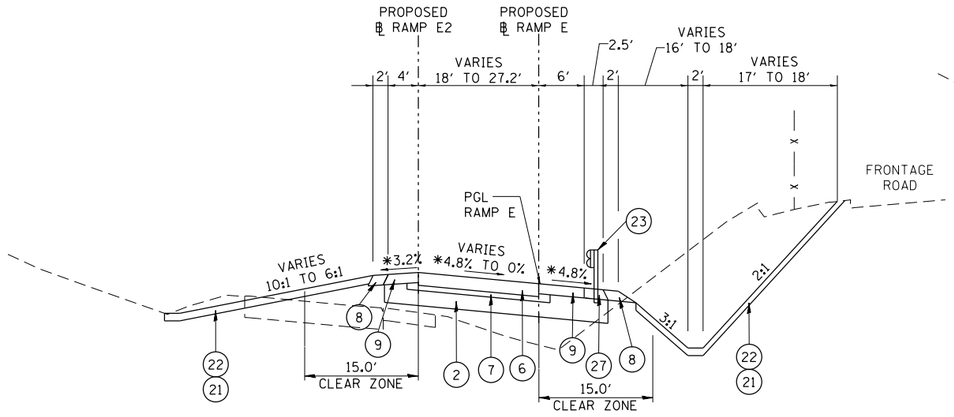
✱CROSS SLOPE VARIES WITHIN SUPERELEVATION TRANSITION

RAMP E / E2
PROPOSED SUPERELEVATED SECTION
STA. 11+62 TO STA. 12+81 /
STA. 24+41 TO STA. 25+58



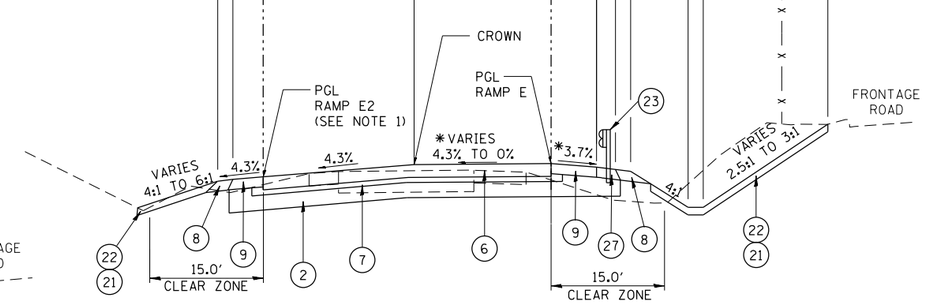
✱CROSS SLOPE VARIES WITHIN SUPERELEVATION TRANSITION

RAMP E2
PROPOSED SUPERELEVATED SECTION
STA. 25+58 TO STA. 26+92



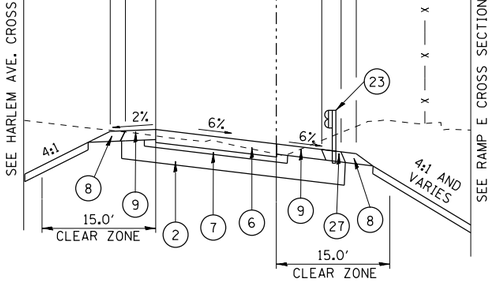
✱CROSS SLOPE VARIES WITHIN SUPERELEVATION TRANSITION

RAMP E / E2
PROPOSED SUPERELEVATED SECTION
STA. 6+97 TO STA. 8+09 /
STA. 20+00 TO STA. 21+14



✱CROSS SLOPE VARIES WITHIN SUPERELEVATION TRANSITION

RAMP E/ E2
PROPOSED SUPERELEVATED SECTION
STA. 10+57 TO 11+62 /
STA. 23+39 TO STA. 24+41



RAMP E
PROPOSED SUPERELEVATED SECTION
STA. 12+81 TO STA. 15+31

NOTES:

1. THE INDEPENDENT PGL FOR RAMP E2 BEGINS AT STA. 23+39. THE PROFILE FOR RAMP E2 FROM STA. 20+00 TO STA. 23+39 IS DEPENDENT ON RAMP E.
2. SEE ROADWAY PLANS FOR FULL SUPERELEVATION AND SUPERELEVATION DETAILS.
3. FULL SUPERELEVATION FROM STA. 23+39 TO STA. 26+50. TRANSITION FROM STA. 26+50 TO STA. 26+99 (HARLEM AVE. EOP).

FILE NAME = D160R49_sht_Typical_Ramp_E2.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/18/2016	DATE -	REVISED -

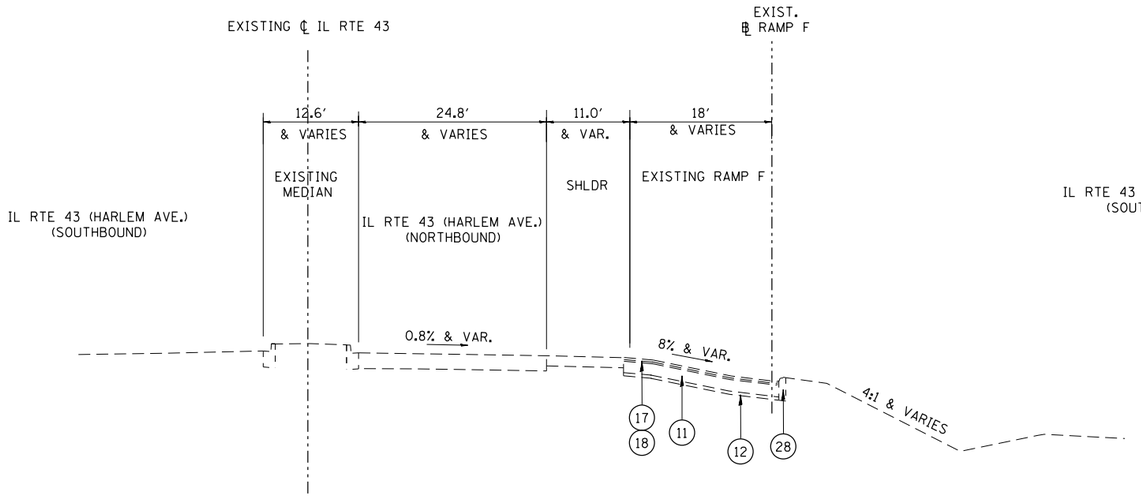
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

RAMP E AND E2
TYPICAL SECTION

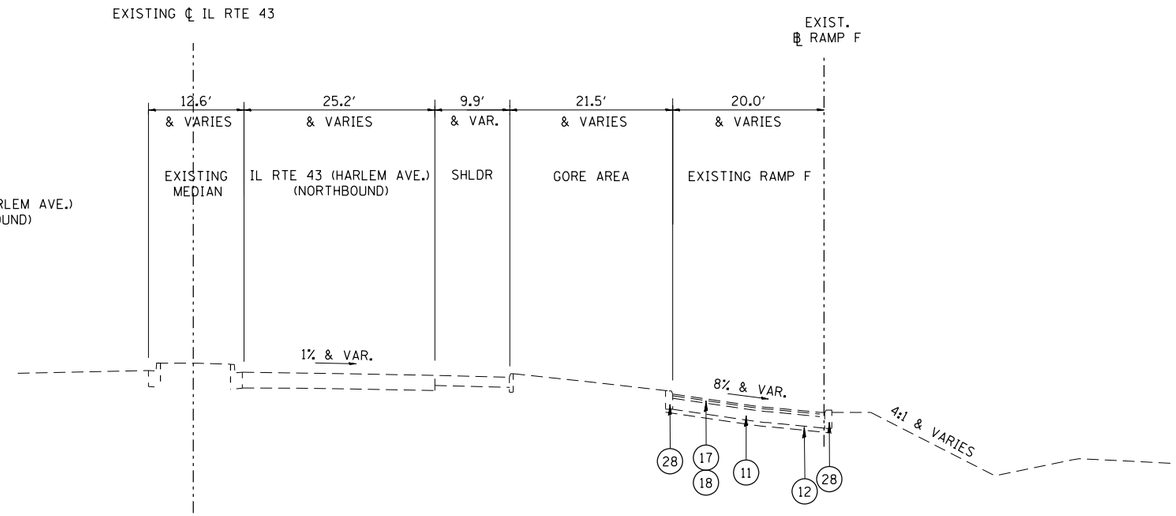
SCALE: NTS | SHEET NO. 1 OF 1 SHEETS | STA.8+09 | TO STA. 15+31

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		14
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

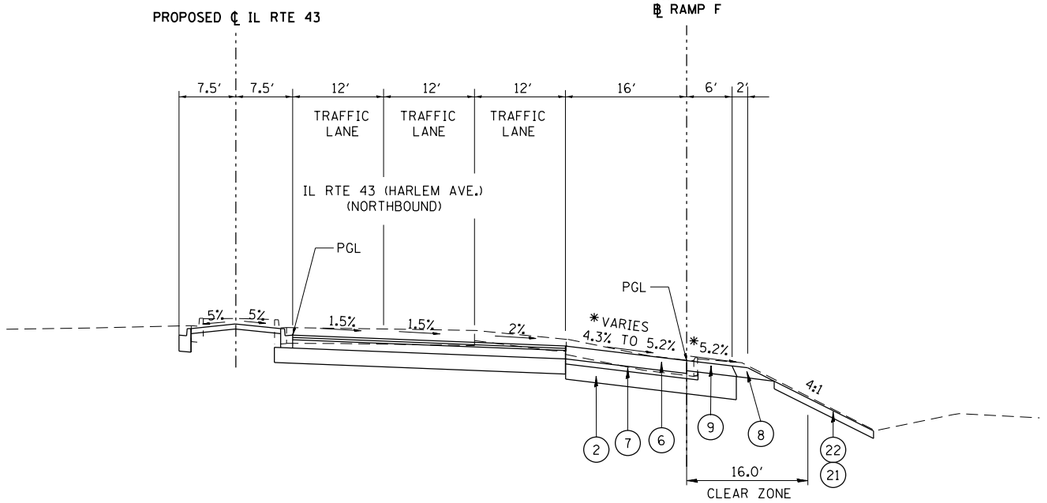
CT5A



RAMP F
EXISTING SUPERELEVATED SECTION
STA. 19+83 TO STA. 20+30

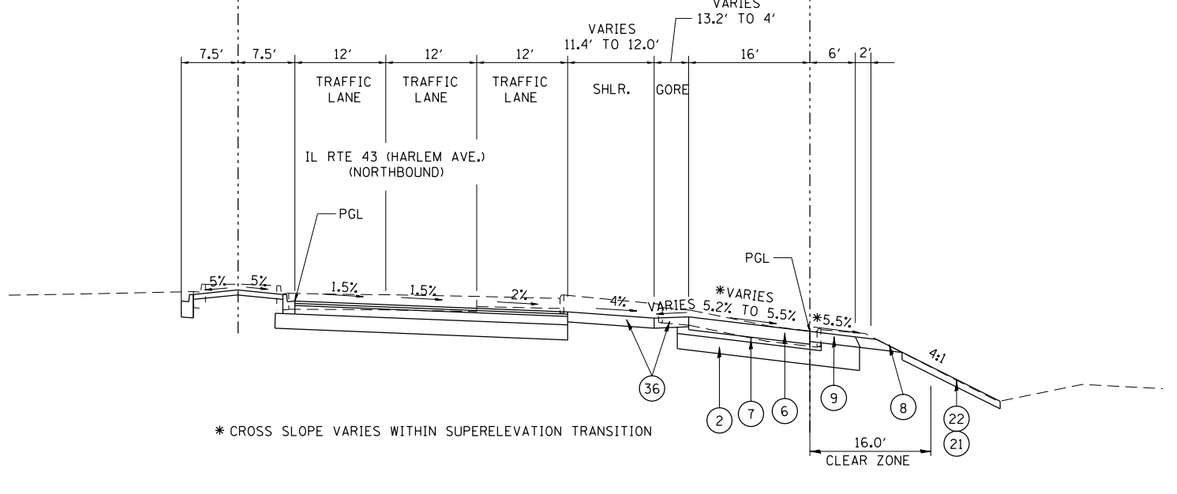


RAMP F
EXISTING SUPERELEVATED SECTION
STA. 20+30 TO STA. 20+49



* CROSS SLOPE VARIES WITHIN SUPERELEVATION TRANSITION

RAMP F
PROPOSED SUPERELEVATED SECTION
STA. 19+83 TO STA. 20+30



* CROSS SLOPE VARIES WITHIN SUPERELEVATION TRANSITION

RAMP F
PROPOSED SUPERELEVATED SECTION
STA. 20+30 TO STA. 20+49

NOTES:

1. FULL SUPERELEVATION FROM STA. 20+76 TO STA. 26+86 TRANSITION FROM STA. 18+86 TO STA. 20+76 AND FROM STA. 26+86 TO STA. 27+76.
2. SEE ROADWAY PLANS FOR FULL SUPERELEVATION AND SUPERELEVATION DETAILS.

FILE NAME = D160R49_sht_Typical_Ramp_F.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/10/2016	DATE -	REVISED -

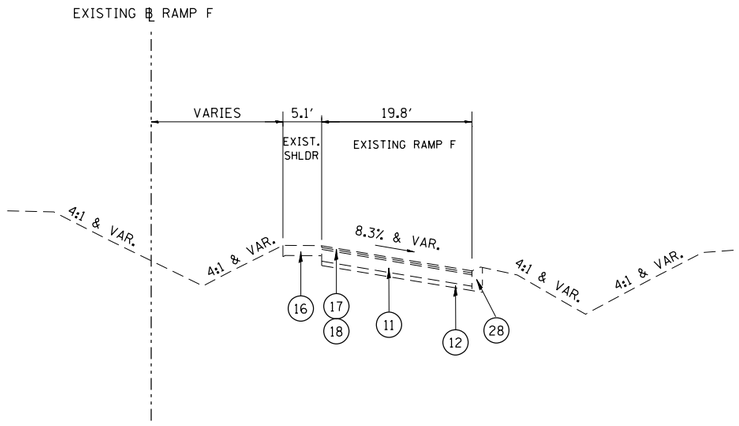
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

RAMP F
TYPICAL SECTIONS

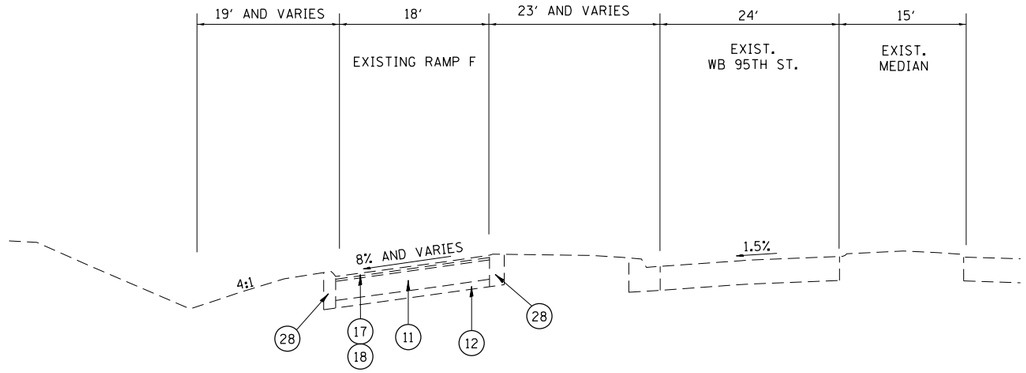
SCALE: NTS | SHEET NO. 1 OF 2 SHEETS | STA.19+83 TO STA. 20+49

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		15
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

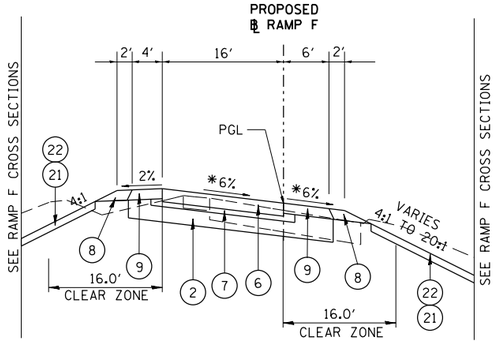
CT6A



RAMP F
EXISTING SUPERELEVATED SECTION
STA. 20+49 TO STA. 27+11

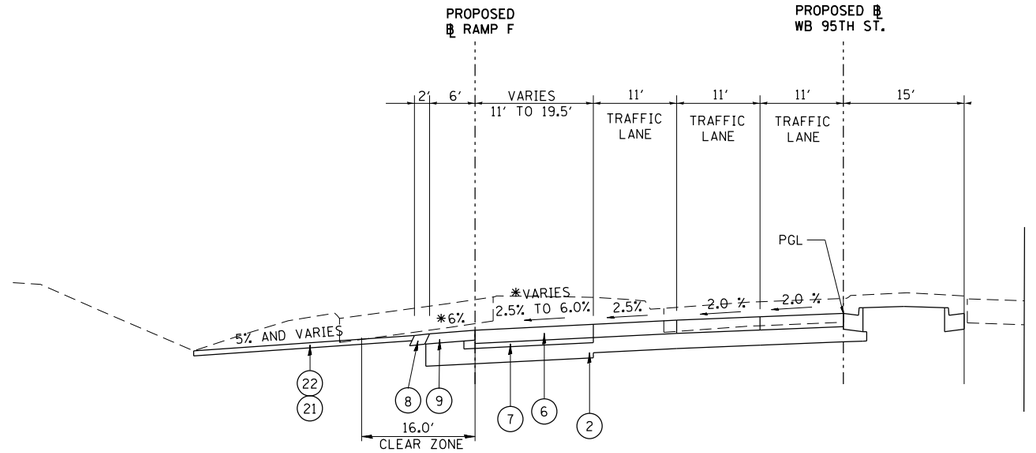


RAMP F
EXISTING SUPERELEVATED SECTION
STA. 27+11 TO STA. 27+76
(LOOKING EAST)



* CROSS SLOPE VARIES WITHIN SUPERELEVATION TRANSITION

RAMP F
PROPOSED SUPERELEVATED SECTION
STA. 20+49 TO STA. 27+11



* CROSS SLOPE VARIES WITHIN SUPERELEVATION TRANSITION

RAMP F
PROPOSED SUPERELEVATED SECTION
STA. 27+11 TO STA. 27+76
(LOOKING EAST)

NOTES:

1. FULL SUPERELEVATION FROM STA. 20+76 TO STA. 26+86 TRANSITION FROM STA. 18+86 TO STA. 20+76 AND FROM STA. 26+86 TO STA. 27+76.
2. SEE ROADWAY PLANS FOR FULL SUPERELEVATION AND SUPERELEVATION DETAILS.

FILE NAME = D160R49_sht_Typical_Ramp_F.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/10/2016	DATE -	REVISED -

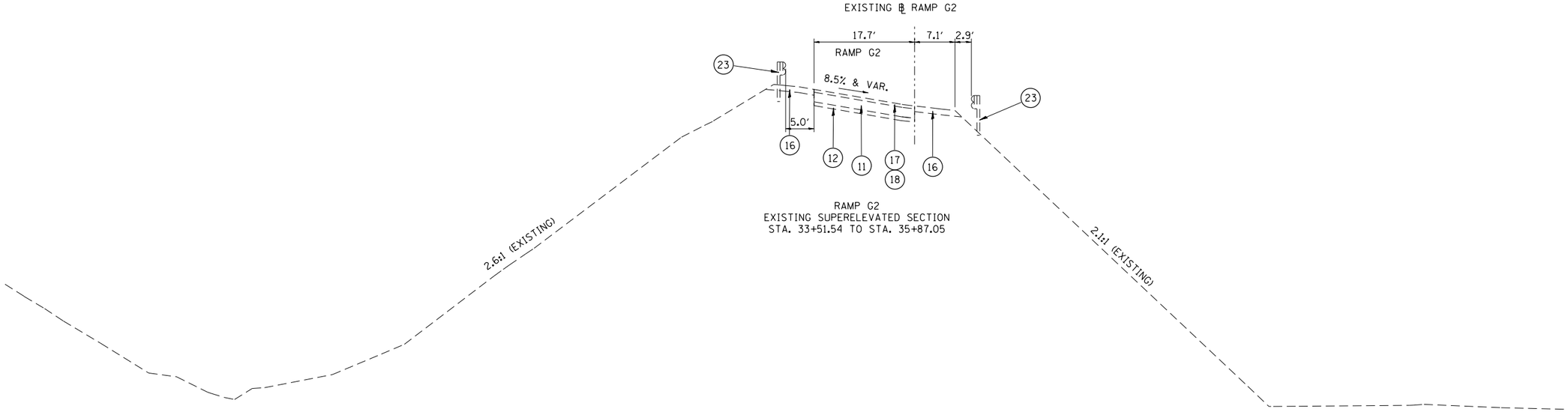
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

RAMP F
TYPICAL SECTIONS

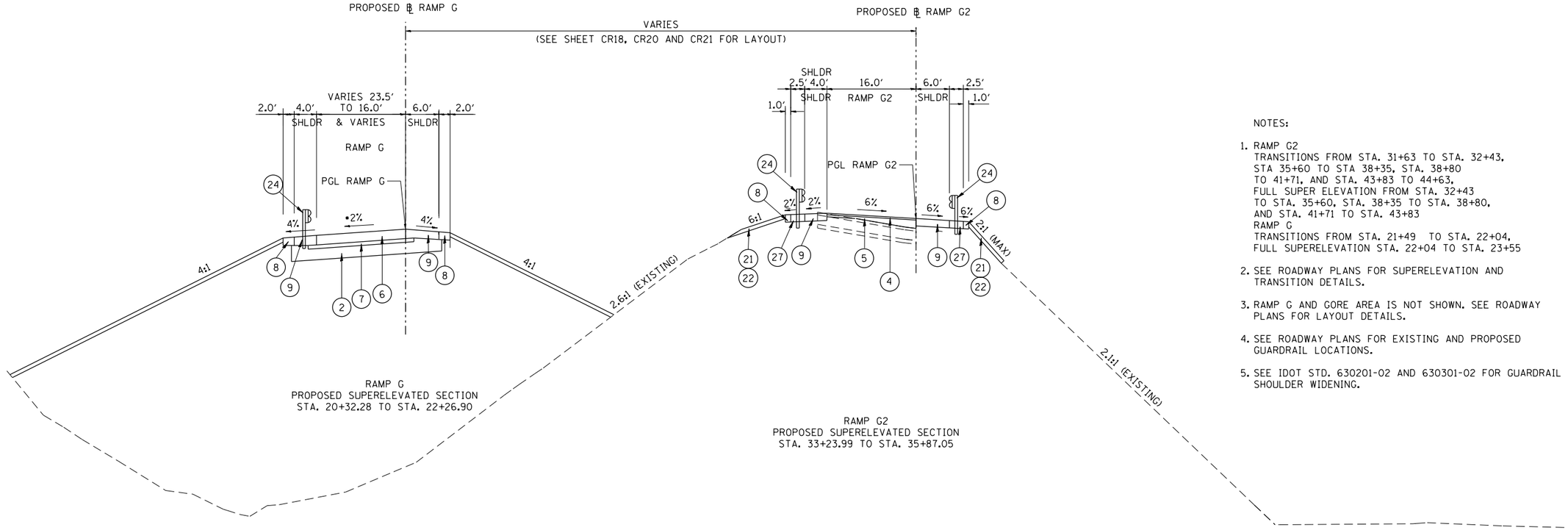
SCALE: NTS | SHEET NO. 2 OF 2 SHEETS | STA.20+49 TO STA. 27+26

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		16
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			

CT6B



RAMP G2
EXISTING SUPERELEVATED SECTION
STA. 33+51.54 TO STA. 35+87.05



RAMP G
PROPOSED SUPERELEVATED SECTION
STA. 20+32.28 TO STA. 22+26.90

RAMP G2
PROPOSED SUPERELEVATED SECTION
STA. 33+23.99 TO STA. 35+87.05

NOTES:

1. RAMP G2
   TRANSITIONS FROM STA. 31+63 TO STA. 32+43,
   STA 35+60 TO STA 38+35, STA. 38+80
   TO 41+71, AND STA. 43+83 TO 44+63,
   FULL SUPER ELEVATION FROM STA. 32+43
   TO STA. 35+60, STA. 38+35 TO STA. 38+80,
   AND STA. 41+71 TO STA. 43+83
   RAMP G
   TRANSITIONS FROM STA. 21+49 TO STA. 22+04,
   FULL SUPERELEVATION STA. 22+04 TO STA. 23+55
2. SEE ROADWAY PLANS FOR SUPERELEVATION AND TRANSITION DETAILS.
3. RAMP G AND GORE AREA IS NOT SHOWN. SEE ROADWAY PLANS FOR LAYOUT DETAILS.
4. SEE ROADWAY PLANS FOR EXISTING AND PROPOSED GUARDRAIL LOCATIONS.
5. SEE IDOT STD. 630201-02 AND 630301-02 FOR GUARDRAIL SHOULDER WIDENING.

FILE NAME = D160R49_sht_Typical_Ramp_G_G2.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/18/2016	DATE -	REVISED -

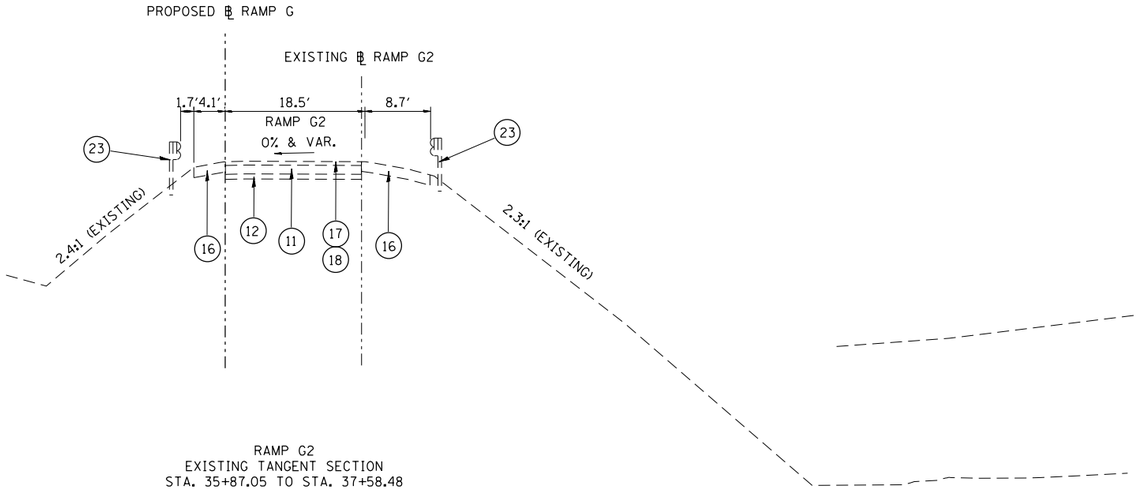
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

RAMP G AND G2
TYPICAL SECTIONS

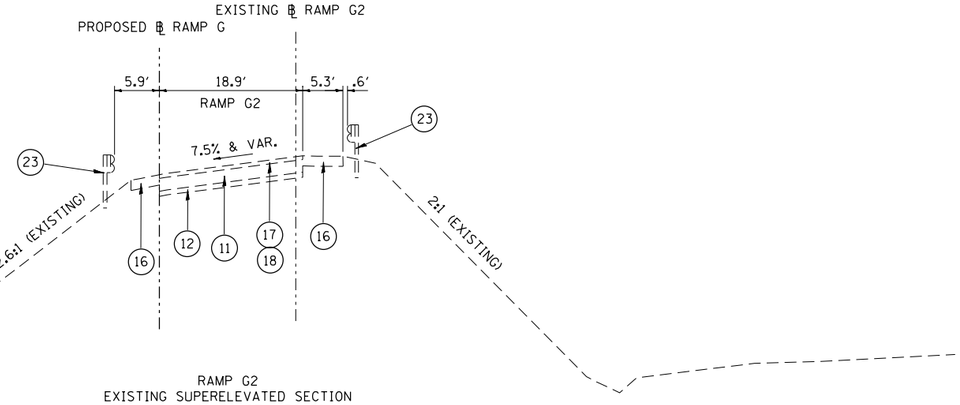
SCALE: NTS | SHEET NO. 1 OF 3 SHEETS | STA.33+51.54 TO STA. 35+87.05

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

CT7A



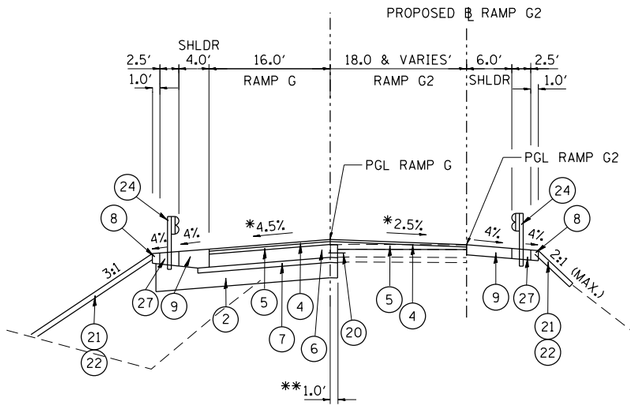
RAMP G2
EXISTING TANGENT SECTION
STA. 35+87.05 TO STA. 37+58.48



RAMP G2
EXISTING SUPERELEVATED SECTION
STA. 37+58.48 TO STA. 39+38.64

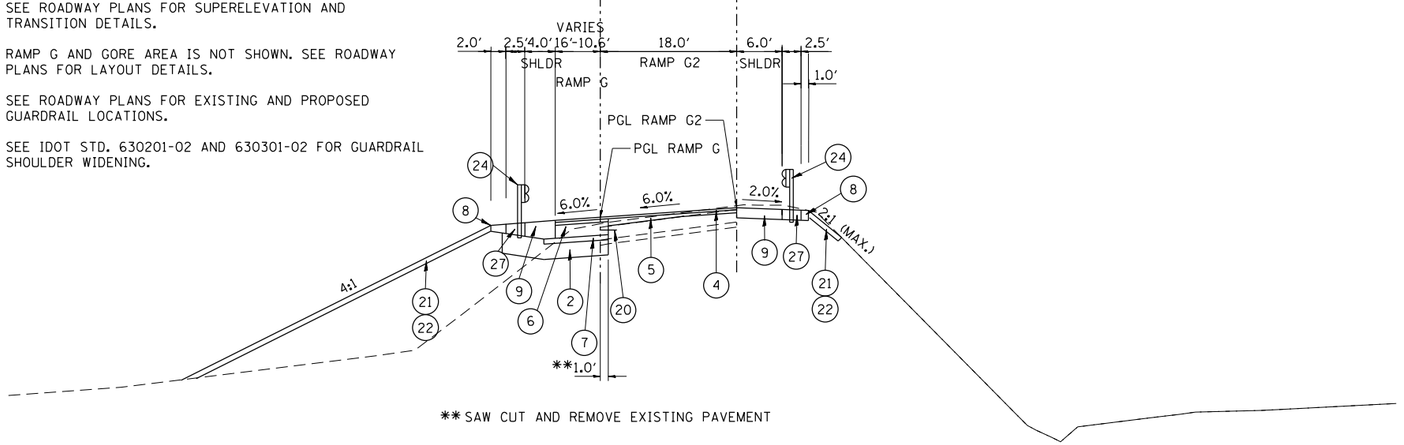
NOTES:

1. RAMP G2
   TRANSITIONS FROM STA. 31+63 TO STA. 32+43,
   STA 35+60 TO STA 38+35, STA. 38+80
   TO 41+71, AND STA. 43+83 TO 44+63,
   FULL SUPER ELEVATION FROM STA. 32+43
   TO STA. 35+60, STA. 38+35 TO STA. 38+80,
   AND STA. 41+71 TO STA. 43+83
   RAMP G
   TRANSITIONS FROM STA. 21+49 TO STA. 22+04,
   FULL SUPERELEVATION STA. 22+04 TO STA. 23+55
2. SEE ROADWAY PLANS FOR SUPERELEVATION AND TRANSITION DETAILS.
3. RAMP G AND GORE AREA IS NOT SHOWN. SEE ROADWAY PLANS FOR LAYOUT DETAILS.
4. SEE ROADWAY PLANS FOR EXISTING AND PROPOSED GUARDRAIL LOCATIONS.
5. SEE IDOT STD. 630201-02 AND 630301-02 FOR GUARDRAIL SHOULDER WIDENING.



*CROSS SLOPE VARIES WITHIN SUPERELEVATION TRANSITION
**SAW CUT AND REMOVE EXISTING PAVEMENT

RAMP G2
PROPOSED SUPERELEVATED SECTION
STA. 35+87.05 TO STA. 37+58.48



**SAW CUT AND REMOVE EXISTING PAVEMENT

RAMP G2
PROPOSED SUPERELEVATED SECTION
STA. 37+58.48 TO STA. 39+38.64

FILE NAME = D160R49_sht_Typical_Ramp_G_G2.DGN	USER NAME = GROodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/18/2016	DATE -	REVISED -

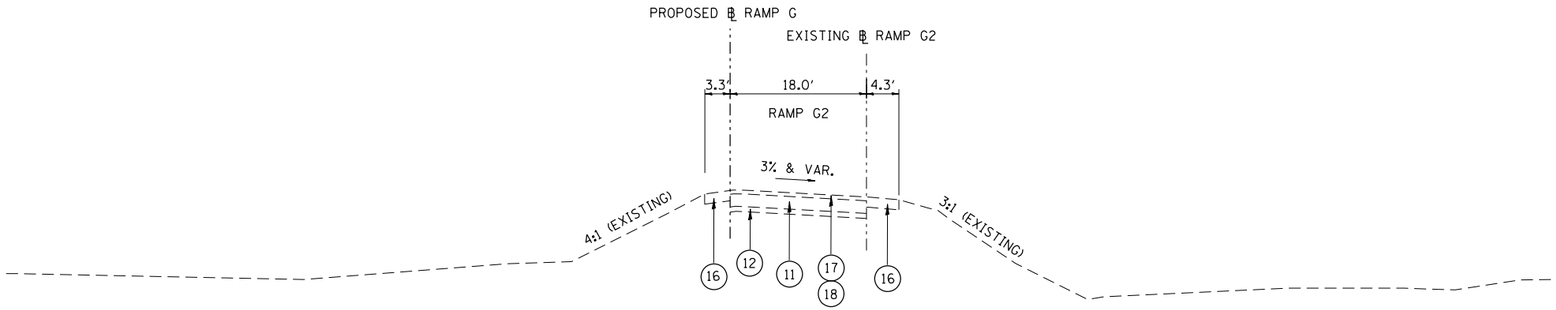
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

RAMP G AND G2
TYPICAL SECTIONS

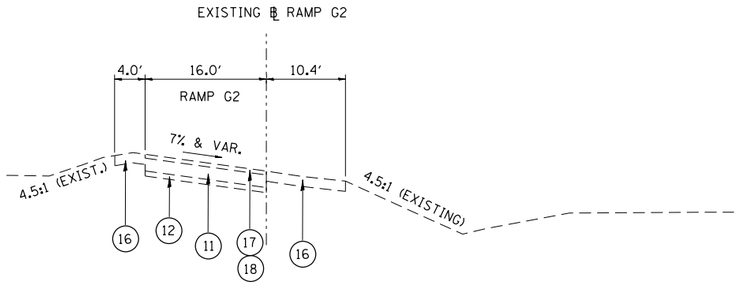
SCALE: NTS | SHEET NO. 2 OF 3 SHEETS | STA.36+36.98 TO STA. 39+38.64

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		
		CONTRACT NO.		
		ILLINOIS	FED. AID PROJECT	

CT7B



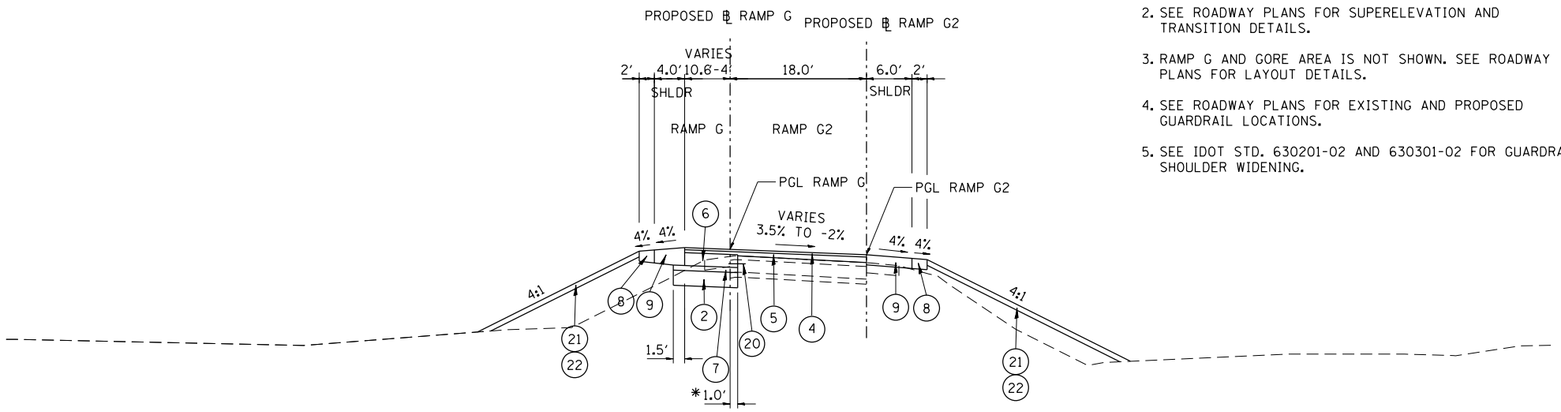
RAMP G2
EXISTING TANGENT SECTION
STA. 39+38.64 TO STA. 41+36.31



RAMP G2
EXISTING SUPERELEVATED SECTION
STA. 41+36.31 TO STA. 44+09.39

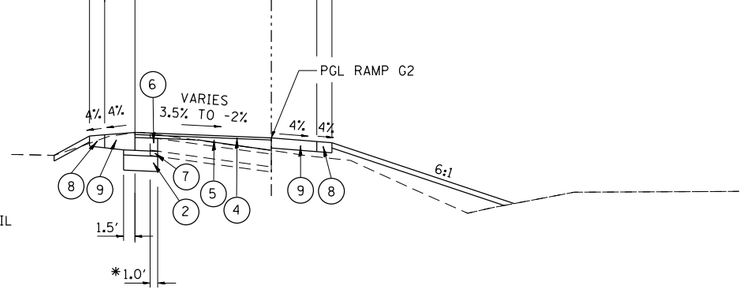
NOTES:

1. RAMP G2
   TRANSITIONS FROM STA. 31+63 TO STA. 32+43,
   STA 35+60 TO STA 38+35, STA. 38+80
   TO 41+71, AND STA. 43+83 TO 44+63,
   FULL SUPER ELEVATION FROM STA. 32+43
   TO STA. 35+60, STA. 38+35 TO STA. 38+80,
   AND STA. 41+71 TO STA. 43+83
   RAMP G
   TRANSITIONS FROM STA. 21+49 TO STA. 22+04,
   FULL SUPERELEVATION STA. 22+04 TO STA. 23+55
2. SEE ROADWAY PLANS FOR SUPERELEVATION AND TRANSITION DETAILS.
3. RAMP G AND GORE AREA IS NOT SHOWN. SEE ROADWAY PLANS FOR LAYOUT DETAILS.
4. SEE ROADWAY PLANS FOR EXISTING AND PROPOSED GUARDRAIL LOCATIONS.
5. SEE IDOT STD. 630201-02 AND 630301-02 FOR GUARDRAIL SHOULDER WIDENING.



*SAW CUT AND REMOVE EXISTING PAVEMENT

RAMP G2
PROPOSED SUPERELEVATED SECTION
STA. 39+38.64 TO STA. 41+36.41

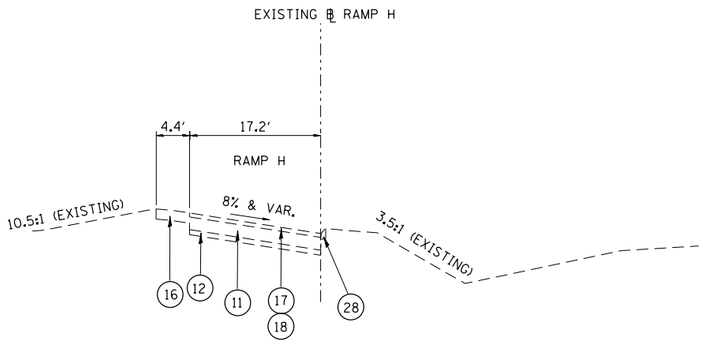


*SAW CUT AND REMOVE EXISTING PAVEMENT

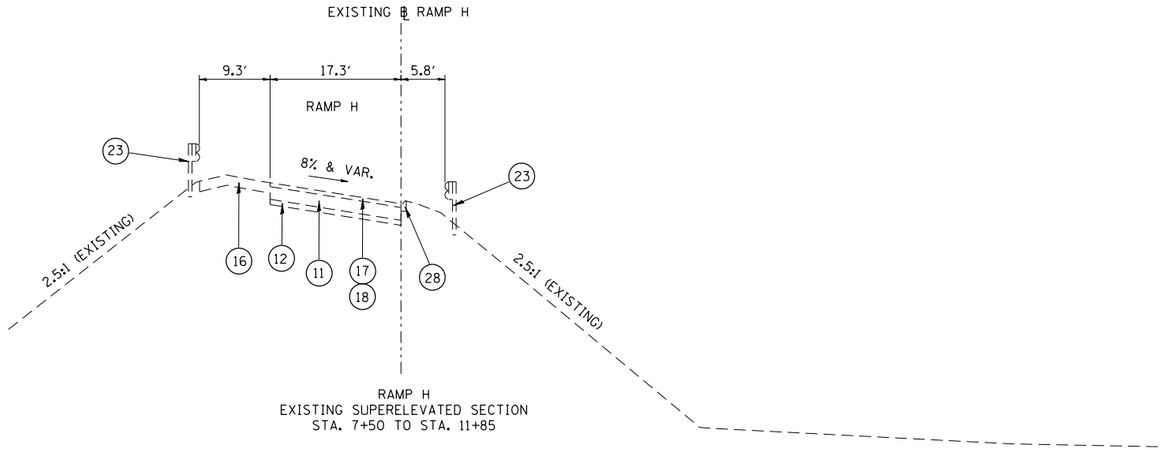
RAMP G2
PROPOSED SUPERELEVATED SECTION
STA. 41+36.31 TO STA. 44+09.39

FILE NAME = D160R49_sht_Typical_Ramp_G_G2.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	RAMP G AND G2 TYPICAL SECTIONS	F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN -	REVISED -					COOK		
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -					CONTRACT NO.		
	PLOT DATE = 2/18/2016	DATE -	REVISED -		SCALE: NTS / SHEET NO. 3 OF 3 SHEETS / STA.39+38.64 TO STA. 44+09.39		ILLINOIS	FED. AID PROJECT		

CT7C



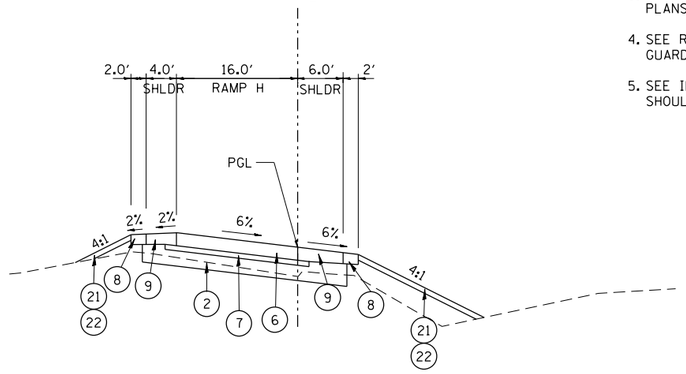
RAMP H
EXISTING SUPERELEVATED SECTION
STA. 4+83 TO STA. 7+50



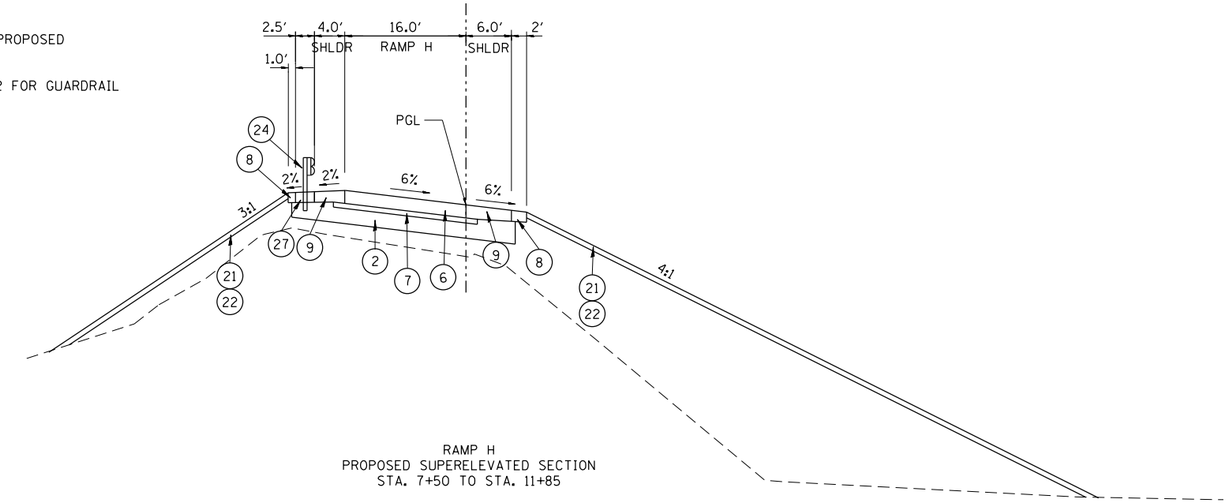
RAMP H
EXISTING SUPERELEVATED SECTION
STA. 7+50 TO STA. 11+85

NOTES:

1. TRANSITION FROM STA. 3+30 TO STA. 4+83.
   FULL SUPER ELEVATION FROM STA. 4+83 TO STA. 11+85
   TRANSITION FROM STA. 11+85 TO STA. 12+75
2. SEE ROADWAY PLANS FOR SUPERELEVATION AND TRANSITION DETAILS.
3. GORE AREA IS NOT SHOWN. SEE ROADWAY PLANS FOR LAYOUT DETAILS.
4. SEE ROADWAY PLANS FOR EXISTING AND PROPOSED GUARDRAIL LOCATIONS.
5. SEE IDOT STD. 630201-02 AND 630301-02 FOR GUARDRAIL SHOULDER WIDENING.



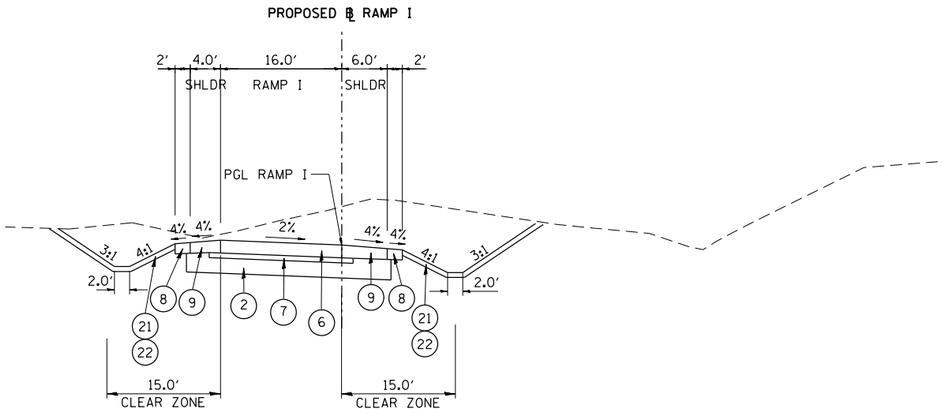
RAMP H
PROPOSED SUPERELEVATED SECTION
STA. 4+83 TO STA. 7+50



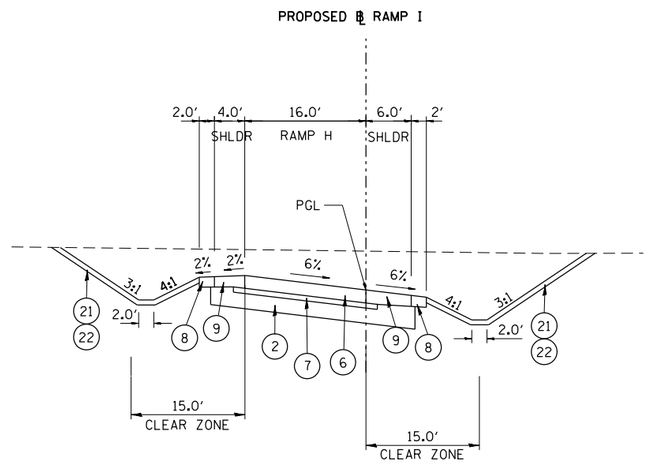
RAMP H
PROPOSED SUPERELEVATED SECTION
STA. 7+50 TO STA. 11+85

FILE NAME = D160R49_sht_Typical_Ramp_H.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	RAMP H TYPICAL SECTIONS	F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN -	REVISED -					COOK		
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -					CONTRACT NO.		
	PLOT DATE = 2/18/2016	DATE -	REVISED -		SCALE: NTS SHEET NO. 1 OF 1 SHEETS STA.4+83 TO STA. 11+85		ILLINOIS	FED. AID PROJECT		

CT8A



RAMP I
PROPOSED TANGENT SECTION
STA. 5+15 TO STA. 8+77



RAMP I
PROPOSED SUPERELEVATED SECTION
STA. 3+42 TO STA. 5+15
STA. 8+77 TO STA. 13+06

NOTES:

1. TRANSITION FROM STA. 3+42 TO STA.3+82
   FULL SUPERELEVATION FROM STA. 3+82 TO STA. 4+50.29
   TRANSITION FROM STA. 4+50.29 TO STA.5+15,
   TRANSITION FROM 8+77 TO STA. 9+87
   FULL SUPERELEVATION FROM STA. 9+87 TO STA. 12+21
   TRANSITION FROM STA. 12+21 TO STA. 13+06.
2. SEE ROADWAY PLANS FOR SUPERELEVATION AND TRANSITION DETAILS.
3. GORE AREA IS NOT SHOWN. SEE ROADWAY PLANS FOR LAYOUT DETAILS.

FILE NAME = D160R49_sht_Typical_Ramp_I.DGN	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 '/ in.	CHECKED -	REVISED -
	PLOT DATE = 2/18/2016	DATE -	REVISED -

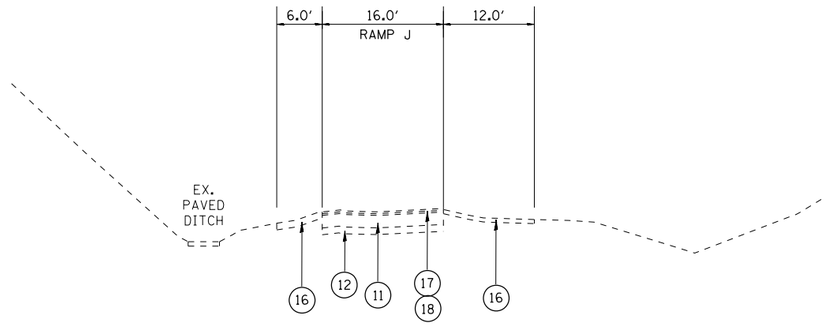
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

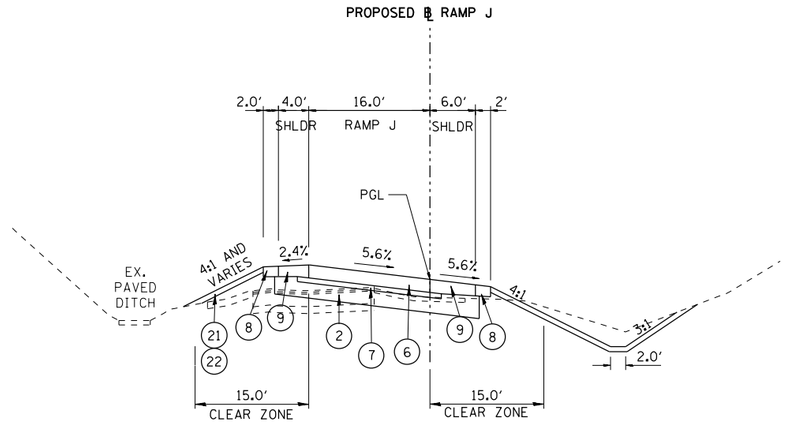
RAMP I
TYPICAL SECTIONS

SCALE: NTS | SHEET NO. 1 OF 1 SHEETS | STA.3+42 TO STA. 13+06

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

CT9A





RAMP J
PROPOSED SUPERELEVATED SECTION
STA. 3+06 TO STA. 7+18.35

PROPOSED SUPERELEVATED SECTION

FULL SUPERELEVATION RATE
S.E. TRANSITION (IN) = STA. 3+06 TO STA. 3+86
FULL S.E. = STA. 3+86 TO STA. 7+18.35

SEE ROADWAY PLANS FOR SUPERELEVATION DETAILS.

NOTES:

1. SEE ROADWAY PLANS FOR SUPERELEVATION AND TRANSITION DETAILS.
2. GORE AREA IS NOT SHOWN. SEE ROADWAY PLANS FOR LAYOUT DETAILS.
3. EXISTING PAVED DITCH BEGINS AT STA. 6+00.

FILE NAME = D160R49_sht_Typical_Ramp_J.dgn	USER NAME = GRGoodman	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 2/18/2016	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

RAMP J
TYPICAL SECTIONS

SCALE: NTS | SHEET NO. 1 OF 1 SHEETS | STA.3+06 | TO STA. 8+89

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK		
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

CT10A